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ALBERTA DEPARTMENT OF THE ENVIRONMENT
WATER RESOURCES MANAGEMENT SERVICES
TECHNICAL SERVICES DIVISION

DRIFTPILE FLOODPLAIN STUDY

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NOVEMBER 1990

EXECUTIVE SUMMARY

The Driftpile River Floodplain Study was undertaken to provide water levels for the 1:100 year flood on the Driftpile River through the Driftpile Indian Reserve 1R 150. The Study covers a 23 km reach of the river through the Reserve.

A brief hydrologic analysis of the flow records of the Driftpile and nearby Swan River were undertaken to estimate the magnitude of the 1:100 year flood. Estimates of the 1987, 1988 and 1989 maximum discharges were also prepared. Water surface profiles were calculated using the HEC-2 computer program. A recent (1988) significant flood in the Driftpile River provided excellent high water mark data to calibrate the geometric model for the HEC-2 analysis.

The Study results indicate that the floodplain width varies from 170 m to over 300 m wide through the reserve, inundating many residences. The floodplain indicated on the 1988 airphoto mosaic for a flood almost equal to the 1:100 year flood indicates that all low lying areas within the shallow valley are flooded. Residences and portions of the Driftpile Indian Reserve and the Hwy 2 bridge are also inundated.

TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY i

TABLE OF CONTENTS ii

List of Tables iii
List of ðFigures iii
Appendices iii

1.0 INTRODUCTION 2

1.1 Study Objective 3
1.2 Study Area 3
1.3 Historical Review of Flooding 3

2.0 HYDROLOGY 3

2.1 Basin Description 3
2.2 Completion of Flow Records 4
2.3 Flood Frequency Distribution 4

3.0 CHANNEL CHARACTERISTICS 5

3.1 River Surveys 6
3.2 Geomorphic Characteristics 6

4.0 CALCULATION OF FLOOD LEVELS 6

4.1 Program Source & Methodology 6
4.2 Geometric Data 7
4.3 Manning's Roughness Coefficients 8

4.3.1 Overbank Roughness Coefficients 8
4.3.2 Channel Roughness Coefficients 9

4.4 High Water Mark Data 9
4.5 Calibration 9
4.6 Sensitivity 10

5.0 COMPUTATION OF 100 YEAR FLOOD ELEVATIONS 11

5.1 Base Mapping 12
5.2 Water Surface Profiles 12
5.3 Extent of Flooding 12
5.4 Effect of Debris 13

REFERENCES 12

LIST OF TABLES

2.1 Instantaneous Flood Frequency Distribution 3
Driftpile River at Driftpile

4.1 Typical Overbank Roughness Values 7
4.2 Model Calibration 8
4.3 Sensitivity Results 9

LIST OF FIGURES

Location Plan F16 1
Study Limits 2
Cross Section Location 3
1983 Flood Mosaic 4
1988 Flood Mosaic 5
Water Surface Profiles 6

APPENDICES

Appendix A - Hydrology Report
Appendix B - Computer Input/Output

1.0 INTRODUCTION

The problem of flooding on the Driftpile Indian Reserve 150, did not arise until recently when three major spring floods hit the Driftpile River in 1983, 1988 and 1989. The resultant flooding of residences created a need to define suitable building locations for future sites. The decision to proceed with the calculation of flood levels followed a Historical Review Study by Hardy BBT Ltd [1]*.

1.1 Study Objective

The purpose of this report is to provide a water surface profile for the Driftpile River through the Driftpile Reserve for the 1:50, 1:100 year return floods (Figure 2). Airphoto mosaics of the 1983 and 1988 floods will also be prepared.

1.2 Study Area

The study area (Figure 1) extends along the Driftpile River from the western to the eastern boundary of the reserve, a distance of 23 km (Figure 2) along the river. The 1983 and 1988 airphoto mosaics covers areas adjacent to the Driftpile River.

1.3 Historical Review of Flooding

The flooding within the Driftpile Reserve has been documented in a report "Review of Historical Flooding at Driftpile Indian Reserve # 150" prepared by Hardy BBT Ltd. [1]

The main cause of flooding is from rainfall/runoff from the Swan Hills. Minor spring flooding has often originated from spring snowmelt. Significant floods occurred in 1983 and 1988, with both events causing flooding of residences along the Driftpile River.

* Numbers in parenthesis [ ] refer to the List of References in the Bibliography.

2.0 HYDROLOGY

2.1 Basin Description

The Driftpile River above the community of Driftpile has a drainage basin of approximately 840 km^2 with the headwaters on the north slopes of the Swan Hills. Since there is a high gradient in the upper section of the Driftpile River where it comes off the Swan Hills, runoff rates are both rapid and large during major events.

2.2 Completion of Flow Records

Water Survey of Canada kept flow records at Driftpile (7BH003) from 1973 - 1986. The record has been extended by utilizing Swan River near Kinuso (7BJ001) which has data from 1915 - 1917 and 1961 - to present. The composite flood record for Driftpile near Driftpile is in the Hydrology report in Appendix A (2).

2.3 Flood Frequency Distribution

The completed maximum annual flood series [2] was analyzed by utilizing a modified Pearson

Type III frequency distribution. The results of the Hydrological analysis can be seen in Table 2-1.

TABLE 2-1

Instantaneous Flood Frequency Analysis

Driftpile River at Driftpile

Return Period (Years)	Maximum Instantaneous Discharge cms
200	524
100	469
50	413
25	356
20	337
10	278
5	215
2	123

3.0 CHANNEL CHARACTERISTICS

In this section, physical and hydraulic characteristics of the Driftpile River and its adjacent valley are presented. Some typical descriptions of the valley itself including a description of the surveys used to measure the river and adjacent floodplains are included.

3.1 River Surveys

River surveys were conducted by Alberta Environment during July-August 1990. Survey access was restricted to open areas as the cutting of trees during the survey was not permitted. Consequently the cross sections were placed in areas which had little or no trees or bush. Thus the majority of the cross section lines covered only a portion of one floodplain and the main channel with no information on the opposite heavily treed floodplain.

3.2 Geomorphic Characteristics

The Driftpile River is surrounded by a continuous wide shallow valley that is similar in character to the Swan River valley[3] which is moderately forested or shrub covered. The area surrounding the valley is partly cultivated on moderately forested lowlands. The Driftpile River itself can be described as tortuous meanders, with point-bars, and old oxbow cutoffs. Thus the channel can be considered moderately unstable with erosion processes ongoing during large floods.

4.0 CALCULATION OF FLOOD LEVELS

4.1 Program Source & Methodology

The computer program HEC-2, used to generate the water surface profiles for this study, was developed by the U.S. Army Corps of Engineers' Hydrologic Engineering Centre [5]. This program and its updated versions have been in constant use in the determination of floodplain and floodplain/floodway boundaries since 1972.

"HEC-2" is a one dimensional computer model used to generate water surface profiles, velocities and flow distribution across a given cross section. It uses Bernoulli's theorem for the total energy of flow at each cross section. The assumptions inherent in this method are: quasi-uniform gradually varied flow, a rigid bed, the direction of flow is perpendicular to the cross section, and the water surface elevation is uniform across the entire cross section.

The HEC-2 program requires geometric, and hydraulic data input to compute the water surface profiles. The geometric component is fulfilled through insertion of surveyed cross section data. The hydraulic component is satisfied by specifying the resistance to flow through the use of Manning's roughness coefficients, or 'n' values. Hydrologic data is provided by the frequency distribution of flood discharges (Table 2-1).

The program is calibrated by adjusting the roughness values in order to reproduce surveyed flood levels for a known flood discharge. Once the program can reproduce one or more previously measured events, then the mathematical model of the existing river can then be used with reasonable confidence to determine other flood profiles.

4.2 Geometric Data

The twenty-seven cross sections surveyed for the study composed the bulk of the geometric data. Figure 3 gives the location of these cross sections. Details at the three bridge sites were supplied from survey bridge notes. The measured data was verified and supplemented by, photographs and detailed description of flow conditions during previous floods.

4.3 Manning's Roughness Coefficients

The hydraulic roughness coefficient (Manning's n-value) defines the resistance to flow of a channel and its floodplain. For estimating the roughness value, each cross section was divided into channel and overbank areas. The overbank areas were further subdivided based on land use and vegetative cover. Examination of aerial photography, supplemented by field reconnaissance and previous experience, established values for overbank roughness coefficients.

4.3.1 Overbank Roughness Coefficients

The roughness coefficients for the overbank portion of the cross sections were selected (Table 4-1) from Chow [4], and from previous experience. Due to the configuration of the river channel and adjacent floodplain, the selected floodplain 'n' values had to be increased considerably to contain the bulk of the flow in the main channel. Without this modification, perhaps only 30% of the flow would be in the main channel at several cross sections, a condition known to be clearly incorrect. By increasing the overbank roughness, large floodplain areas were inundated, but did not contribute significantly to the effective flow area.

TABLE 4.1

Typical Overbank Roughness Values

Overbank	Initial Roughness 'n' Range	Final Roughness Range
High Water Channels	0.040 - 0.050	0.06 - 0.09
Gravel Bars, Shrubs	0.045 - 0.055	0.05 - 0.06
Pasture, Short to Long Grass	0.045 - 0.055	0.06 - 0.10
Brush, Scattered to Medium	0.06 - 0.08	0.12 - 0.14
Bush, Medium to Dense	0.08 - 0.12	0.14 - 0.18

4.3.2 Channel Roughness Coefficients

The main channel for the study area carries the majority of the flow and its roughness varies with the discharge. A preliminary estimate of 0.04 was assumed for the channel roughness coefficient at high discharges. This 'n' value is comparable to the values used for other flood studies in a similar terrain. Subsequent calibration to the known high water marks resulted in a channel roughness factor ranging from a minimum of 0.035 to a maximum of 0.046.

4.4 High Water Mark Data

High water mark data was gathered from previous floods. Complete records were available for the 1988 and 1989 floods only; all other floods were missing either discharge measurements or high water marks. The high water marks are documented in the report by Hardy BBT (1).

4.5 Calibration

Calibration of a HEC-2 computer model consists of using known water surface elevations to select an appropriate channel roughness coefficient. The discharge is entered into the model and the channel roughness coefficient varied in successive 'trials' until the computed water surface profile matches the measure profile.

With the selected channel roughness (Section 4.3.2) the computed water surface profile matches (Table 4-2) the existing downstream water surface profile from the 1988 flood (Q=450 cms).

TABLE 4-2

1988 Model Calibration

Location 1988 HWM	HWM Elevation (m)	Computed Approximate Cross Section	Computed Elevation (m)	Difference (m)
3700 m d/s 89.7*(14)**	588.34	7	588.40	+.06
120 m d/s 89.1 (10)	591.78	18	591.80	+.02
at 89.1 (11)	592.10	19	591.97	-.13
10 m u/s 89.2 (5)	592.83	22	592.96	+.13
40 m u/s 89.3 (3)	593.55	23	593.20	-.35
250 m u/s 89.4 (1)	596.26	27	576.25	-.01
		mean deviation = .12 m		0.70 m

* 89.7 refers to established location of high water mark sites surveyed in 1989. An attempt was made to calibrate the model to the 1989 flood. However, calculated water levels were about 0.6 - 1.1 m too low. Since the 1988 flood was almost a 1:100 year return flood, a decision to utilize the 1988 high water marks was made.

** (14) refers to the number of the 1988 high water mark

4.6 Sensitivity

Sensitivity testing of a model was conducted primarily as a check on the accuracy of the assumed roughness in order to compute the measured water surface elevation. However, it can also be used to test the validity of the chosen roughness. In the case of the Driftpile River at Driftpile, the channel roughness required to compute measured flood levels were found to be, in most instances, within reasonable limits for channel roughness in a river of this type. To determine the model's reaction to increased or decreased roughness, channel roughness values were increased and decreased to observe the difference in water levels at the high water mark sites. The results are shown below.

TABLE 4-3

Sensitivity Results

Channel Roughness	% Change	Mean Change in Water Surface Elevation
.042 - .055	+20%	+0.24 m
.028 - .037	-20%	-0.45 m

The above table indicates that at lower channel roughness values, the calculated water levels are more easily influenced by any changes in channel roughness. Since the changes in channel roughness are not extreme, and the coefficients are within the range used by other flood studies, the roughness values selected were deemed reasonable and the calibration accepted as shown in Table 4-2.

5.0 COMPUTATION OF 100 YEAR FLOOD ELEVATIONS

In this section, the calculations of the 100 year and other discharge water surface profiles is explained. The resulting flooding on the Reserve for these flood is discussed.

5.1 Base Mapping

The available mapping for this area consists of 1:50,000 NTS mapping with a 50 ft contour internal. This mapping has insufficient detail to plot the detailed flood boundaries. Additional flooding details were available from a 1986, 10:000 scale airphoto mosaic prepared by Hardy BBT. Mosaics were also prepared for the 1983 and 1988 floods. These airphoto mosaics are uncorrected for distortion and thus distances are approximate. Since the 1988 airphoto mosaic shows a larger area of the reserve, this mosaic area chosen to show both the details of the survey, highwater marks and the approximate 1988 flood limits. Since no mapping exists with a 1 or 2 m contour interval, a floodplain delineation showing the extent of flooding during a 1:100 year return flood cannot be provided. In its place the 1988 flood (almost a 1:100 year flood) and water surface profiles are provided.

5.2 Water Surface Profiles

The results of this study are shown as a series of water surface profiles in Figure 6. These profiles were generated from the HEC-2 geometric model after calibration with highwater marks and adjustments with regard to the flood frequency being examined. The profiles show the thalweg of the channel, the 1:10, 1:25, 1:50 and 1:100 year floods.

5.3 Extent of Flooding

The flooding during a 1:100 year flood will be only 0.1 m greater than the 1988 flood. Thus the 1988 flood mosaic will indicate the approximate extent of the 1:100 year floodplain. The flood peaked in the early morning on July 7 at the Hwy 2 bridge and the flood photography was taken on July 8. Thus the airphotography shows the river to be well within its banks and at least 2 m lower than pools of silt laden water on the adjacent banks. The 1988 flood delineation does not show areas that have drained between the time of the flood peak and time of photography.

5.4 Effect of Debris

During flood events, large amounts of debris are swept down from the Swan Hills along the Driftpile River. While no major log jams have formed, there is a continual mention of debris being swept down river in historical comments on flooding. The high water mark surveys also mention some minor log jams. The possibility of a major debris jam exists, yet cannot be considered in the water surface profile calculations. It could easily occur at any one of the tight bends or perhaps at one of the bridge crossings. Should a large jam occurs, water levels in the area could rise 1 m or more and cause major erosion of the bed and banks of the Driftpile River.

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4. Chow, V.T.(Ed) (1990)
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computer program updated July 1990.

APPENDIX A

HYDROLOGY REPORT
7BH
90-244

Flood Frequency Analysis
Driftpile River near Driftpile

Prepared for

River Engineering Branch

Prepared by:

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Hydrology Technologist

Reviewed by:

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Alberta ENVIRONMENT
HYDROLOGY Branch

EDMONTON

OCTOBER 1990

FLOOD FREQUENCY ANALYSIS
DRIFTPILE RIVER NEAR DRIFTPILE

The River Engineering Branch has requested that a flood frequency analysis be carried out for the Driftpile River Near Driftpile. The information is to be used for a flood study at this site.

Hydrometric data are available for the Driftpile River Near Driftpile from 1973 to 1986 providing only 14 years of record. This record is extended using Swan River Near Kinuso which has been recording data from 1915 to 1917 and from 1961 to present.

For those years where the annual maximum instantaneous flows Q_i are not available for Swan River, but the maximum mean daily flows Q_d are identified, peak flows are obtained based on a regressional relationship between Q_i and Q_d. The relationship for the Swan River is given in Equation 1.

$$Q_i = 1.762\ Q_d^{\,0.91946} \qquad \text{..... Equation 1}$$

The index of determination for Equation 1 is 0.93932 and the standard error of estimate is approximately 13 percent.

Table 1 presents the Swan River data set void filled with Equation 1.

Table 1: Maximum Annual Discharges For Swan River Near Kinuso W.S.C. Station 07BJ001

Year	Maximum Mean Daily Discharge (cms)	Maximum Instantaneous Discharge (cms)
1915	68.0	85.3 e
1916	85.0	104.7 e
1917	493	527 e
1961	214	351
1962	165	188
1963	150	176.5 e
1965	195	224.7 e
1966	68.0	116
1967	86.9	91.5
1968	160	182
1969	155	167
1970	185	213
1971	323	334
1972	192	232
1973	179	189
1974	235	257
1975	314	343
1976	258	294
1977	199	216
1978	216	225
1979	348	362
1980	83.7	92.8
1981	87.4	97.2
1982	183	200
1983	441	571
1984	245	257
1985	166	182
1986	289	332
1987	84.7	125
1988	580	654
1989	341	354

e - values calculated using Equation 1

A regressional relationship between Q_i Driftpile and Q_i Swan is used to extend the Driftpile period of record as given in Equation 2.

$$Q_d = 0.1678\ Q_s^{1.218} \qquad \text{..... Equation 2}$$

Where : Q_d is the maximum instantaneous discharge at Driftpile River

Q_s is the maximum instantaneous discharge at Swan River.

The standard error of estimate for Equation 2 is approximately 22 percent and the index of determination is 0.894.

Table 2 presents the Driftpile River data set extended using Equation 2.

Table 2 : Annual Maximum Instantaneous Discharges - Driftpile RIver Near Driftpile W.S.C. Stn. 07BH003

Year	Maximum Instantaneous Discharge (cms)	
1915	37.7	e
1916	48.4	e
1917	346	e
1961	211	e
1962	98.7	e
1963	91.4	e
1965	123	e
1966	54.8	e
1967	41.1	e
1968	94.9	e
1969	85.5	e
1970	115	e
1971	199	e
1972	128	e
1973	129	
1974	180	
1975	210	
1976	189	
1977	109	
1978	104	
1979	220	
1980	36.6	
1981	47.6	
1982	125	
1983	312	
1984	99.6	
1985	75.5	
1986	273	
1987	60.1	e
1988	450	e
1989	213	e

e values calculated using Equation 2.

A modified Pearson Type III frequency distribution is used to define the maximum instantaneous discharges for the Driftpile River. The results of the frequency analysis are presented in Table 3.

Table 3 : Flood Frequency Analysis for Driftpile River Near Driftpile

Return Period (Years)	Maximum Instantaneous Discharge (cms)
200	524
100	469
50	413
25	356
20	337
10	278
5	215
2	123

Prepared by: _____

Dave Siemonsen
Hydrology Technologist

EDMONTON OCTOBER 1990

APPENDIX B

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**********************************************************
*  WATER SURFACE PROFILES                                *
*                                                        *
*  VERSION OF NOVEMBER 1976                              *
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*  UPDATED MAY 1984                                      *
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*  IBM-PC-XT VERSION AUGUST 1985                         *
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*  (916) 440-2105 (FTS) 448-2105     *
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X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX           XXXXXXX
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  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
**************************************************

T1 DRIFTPILE RIVER NEAR SLAVE LAKE  -  FLOODPLAIN STUDY
T2 DATA BASE - 3 BRIDGES   DATA1 - 1:100 YEAR FLOOD
T3 DRIFTPILE RIVER FLOODPLAIN STUDY

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
       0.        0.        0.        0.   .000600      1.00        .0      469.      .000      .000
J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
    -1.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000
J3  VARIABLE CODES FOR SUMMARY PRINTOUT
    110.000   120.000   150.000      .000      .000      .000      .000      .000      .000      .000

NC      .095      .095      .050      .100      .300      .000      .000      .000      .000      .000
NH     3.000      .055     4.500      .038    47.700      .050    85.000      .000      .000      .000
X1     1.000    29.000     4.500    47.700      .000      .000      .000      .000      .000      .000
GR   582.030      .000   582.000     4.500   581.510     6.500   581.290    10.000   581.020    13.000
GR   580.740    14.000   579.610    15.500   578.210    19.000   577.930    19.500   577.610    23.000
GR   577.330    28.000   577.180    31.000   577.030    34.000   577.430    37.000   577.930    40.500
GR   578.070    41.000   579.370    44.000   580.310    47.000   583.010    47.700   583.150    52.000
GR   582.790    57.000   582.850    62.000   582.880    62.800   582.680    66.800   582.270    69.800
GR   583.080    74.000   582.130    77.000   583.010    80.500   582.330    85.000      .000      .000

NH     3.000      .065     8.500      .038    48.500      .065   130.000      .000      .000      .000
X1     2.000    38.000     8.500    48.500  1088.000  1040.000  1094.000      .000      .000      .000
GR   582.280      .000   582.290     3.000   582.310     6.000   582.190     8.500   580.820    10.500
GR   579.550    12.000   578.400    14.000   578.220    18.500   577.920    23.000   577.770    27.000
GR   577.420    30.000   577.070    33.000   576.970    36.000   577.720    40.000   578.220    41.500
GR   579.200    43.000   580.320    45.000   581.940    47.000   583.950    48.500   584.000    50.000
GR   583.930    55.000   584.020    60.000   583.920    65.000   583.930    70.000   583.920    75.000
GR   583.860    80.000   583.820    85.000   583.820    90.000   583.750    95.000   583.770   100.000
GR   583.620   105.000   583.720   110.000   583.670   111.500   583.330   115.000   584.020   119.000
GR   584.040   122.000   583.940   125.000   583.120   130.000      .000      .000      .000      .000

NH     4.000      .070     4.000      .038    47.500      .140   267.000      .100   284.000      .000
X1     3.000    59.000     4.000    47.500  2554.000  2450.000  2734.000      .000      .000      .000
GR   584.810      .000   584.670     4.000   583.710     9.000   582.510    12.000   580.140    15.000
GR   579.640    17.500   579.480    20.500   579.130    24.000   578.980    27.000   578.770    30.000
GR   578.680    33.000   577.830    36.000   578.760    39.000   579.480    40.000   579.920    41.000
GR   582.010    43.500   582.970    46.000   585.380    47.500   585.280    50.500   585.290    55.000
GR   585.370    60.000   585.290    65.000   585.230    70.000   585.190    75.000   585.140    80.000
GR   585.160    85.000   585.140    90.000   585.110    95.000   585.020   100.000   585.080   105.000
```



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GR   585.040   110.000   584.980   115.000   584.900   120.000   585.000   125.000   585.000   130.000
GR   584.840   135.000   584.710   140.000   584.820   145.000   584.920   150.000   584.920   155.000
GR   584.820   160.000   584.790   165.000   584.820   170.000   584.780   175.000   584.640   180.000
GR   584.740   190.000   584.620   200.000   584.510   210.000   584.470   220.000   584.250   230.000
GR   584.310   240.000   584.190   250.000   584.220   260.000   584.190   263.000   583.690   267.000
GR   584.550   275.000   584.300   278.000   583.920   281.000   583.630   284.000      .000      .000

NH     4.000      .065     9.700      .040    50.300      .160   393.000      .120   407.000      .000
X1     4.000    44.000     9.700    50.300  2530.000  2475.000  2543.000      .000      .000      .000
GR   586.030      .000   585.930     3.000   585.480     6.000   584.980     9.700   583.380    13.000
GR   581.810    16.000   580.910    18.000   580.840    20.000   580.670    23.500   580.380    24.500
GR   580.080    28.000   580.030    31.000   579.880    34.000   579.680    37.000   579.480    40.000
GR   580.380    43.000   581.380    45.000   581.180    47.000   584.680    49.000   586.230    50.300
GR   586.210    53.100   586.180    54.000   585.980    74.000   585.800    94.000   585.760   114.000
GR   585.760   134.000   585.580   154.000   584.890   174.000   585.290   194.000   584.920   214.000
```

GR	584.000	234.000	585.420	254.000	585.430	274.000	585.030	294.000	585.260	314.000
GR	585.310	334.000	585.010	354.000	584.860	374.000	585.290	385.000	585.020	393.000
GR	585.590	397.000	585.600	400.000	585.500	403.000	584.910	407.000	.000	.000
NH	5.000	.120	4.000	.140	406.000	.160	446.900	.040	491.000	.055
NH	516.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	5.000	54.000	446.900	491.000	1147.000	1186.000	1158.000	.000	.000	.000
GR	586.260	.000	586.240	2.000	586.210	4.000	586.090	6.000	586.030	26.000
GR	585.950	46.000	585.960	66.000	586.010	86.000	586.060	106.000	586.210	126.000
GR	586.290	146.000	586.290	166.000	586.250	186.000	586.330	206.000	586.430	226.000
GR	586.490	246.000	586.520	266.000	586.470	286.000	586.360	306.000	586.420	326.000
GR	586.270	346.000	586.290	366.000	586.310	386.000	586.440	396.000	586.640	406.000
GR	586.690	411.000	586.780	416.000	586.880	421.000	586.970	426.000	587.010	431.000
GR	587.110	436.000	586.820	441.000	586.710	446.000	586.800	446.900	586.530	449.100
GR	584.300	452.000	584.060	454.000	582.650	456.000	580.950	458.000	580.050	460.000
GR	580.200	463.000	580.250	466.000	580.400	469.000	580.350	472.000	580.950	474.000
GR	582.540	478.000	583.420	478.500	584.570	481.000	585.660	486.000	585.590	488.500
GR	586.820	491.000	586.940	496.000	586.500	506.000	586.240	516.000	.000	.000
NH	4.000	.120	500.000	.160	550.000	.040	645.800	.080	655.000	.000
X1	6.000	70.000	550.000	645.800	1050.000	960.000	1064.000	.000	.000	.000
GR	586.580	.000	587.330	20.000	587.240	40.000	587.290	60.000	587.300	80.000
GR	587.270	100.000	587.380	120.000	587.400	140.000	587.240	160.000	587.050	180.000
GR	587.000	200.000	586.900	220.000	586.950	240.000	587.070	260.000	587.190	269.000
GR	587.150	280.000	587.150	300.000	587.040	320.000	587.110	338.000	586.260	341.000
GR	585.760	343.000	586.260	346.000	587.310	353.000	587.180	360.000	587.200	380.000
GR	587.230	400.000	587.150	420.000	587.260	440.000	585.460	455.000	585.940	470.000
GR	586.050	485.000	587.330	500.000	587.430	520.000	587.320	540.000	587.530	550.000
GR	587.480	555.000	587.450	560.000	587.560	565.000	587.520	570.000	587.580	575.000
GR	587.420	580.000	587.470	585.000	587.600	590.000	587.560	593.000	586.510	593.500
GR	585.580	599.000	585.610	602.000	584.200	605.000	581.980	608.000	581.370	609.000
GR	580.820	611.000	580.770	614.000	580.920	617.000	581.070	620.000	581.070	623.000
GR	581.120	626.000	581.220	629.000	581.370	631.000	581.390	634.000	581.170	635.000
GR	581.370	636.000	581.910	636.500	582.560	638.000	583.570	641.000	584.810	643.000
GR	586.150	645.000	587.180	645.800	587.410	647.000	587.480	650.000	587.460	655.000

1

12-05-90 11:10:33 PAGE 3

NH	5.000	.095	60.000	.120	100.000	.140	459.000	.040	502.000	.085
NH	510.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	7.000	46.000	459.000	502.000	690.000	675.000	688.000	.000	.000	.000
GR	587.710	.000	587.710	20.000	587.600	40.000	587.380	60.000	587.240	77.000
GR	586.960	95.000	586.880	100.000	587.660	120.000	587.530	140.000	587.610	160.000
GR	587.610	180.000	587.710	200.000	587.580	220.000	587.730	240.000	587.770	260.000
GR	587.810	280.000	587.830	300.000	587.910	320.000	587.740	340.000	587.970	360.000
GR	588.000	380.000	588.270	400.000	588.500	420.000	588.870	440.000	588.320	445.000
GR	587.490	450.000	587.490	455.000	587.910	459.000	586.410	462.000	585.130	465.000
GR	583.620	466.500	581.780	471.000	580.530	477.000	581.180	480.000	581.430	483.000
GR	581.630	486.000	581.780	488.500	582.230	492.000	582.580	494.000	583.680	495.500
GR	584.660	496.500	586.160	499.000	587.460	502.000	587.300	504.000	587.690	507.000
GR	587.710	510.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	7.000	.090	10.000	.040	46.500	.160	200.000	.180	700.000	.120
NH	940.000	.160	1500.000	.118	1606.000	.000	.000	.000	.000	.000
X1	8.000	81.000	10.000	46.500	1080.000	1120.000	1120.000	.000	.000	.000
GR	587.530	.000	587.700	5.000	588.520	8.000	587.160	10.000	586.620	12.000
GR	584.520	15.000	583.510	16.500	582.570	18.000	582.420	21.000	582.160	21.500
GR	581.260	24.000	581.010	27.000	581.410	30.000	580.860	33.000	581.510	36.000
GR	582.060	37.500	582.880	39.000	583.680	42.000	585.140	45.000	588.800	46.500
GR	588.820	50.000	588.780	70.000	588.790	90.000	588.890	110.000	588.540	130.000
GR	588.640	150.000	588.400	160.000	587.260	170.000	588.180	200.000	587.980	230.000
GR	587.770	260.000	586.910	290.000	586.540	320.000	585.650	350.000	585.430	380.000
GR	586.150	410.000	587.400	440.000	586.680	470.000	587.430	500.000	587.750	530.000
GR	585.850	560.000	587.550	582.000	587.740	590.000	587.280	620.000	587.270	630.000
GR	586.780	632.000	587.260	640.000	586.900	670.000	586.900	700.000	586.770	730.000
GR	586.550	760.000	586.370	790.000	586.240	820.000	586.160	850.000	586.050	880.000
GR	585.940	910.000	585.850	940.000	585.650	970.000	585.780	1000.000	585.620	1030.000
GR	585.670	1060.000	585.530	1090.000	585.490	1120.000	585.430	1150.000	585.470	1180.000
GR	585.370	1210.000	585.330	1240.000	585.280	1270.000	585.250	1300.000	585.130	1330.000
GR	584.840	1360.000	584.820	1390.000	584.950	1410.000	584.830	1440.000	584.720	1470.000
GR	584.720	1500.000	584.730	1530.000	584.610	1560.000	584.910	1560.000	584.910	1590.000
GR	585.480	1606.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	4.000	.120	405.000	.160	415.000	.040	451.000	.090	465.000	.000
X1	9.000	48.000	415.000	451.000	915.000	926.000	920.000	.000	.000	.000
GR	588.570	.000	589.090	4.000	589.340	10.000	588.830	25.000	588.660	45.000
GR	588.810	62.000	588.950	65.000	588.920	85.000	588.760	105.000	588.780	125.000
GR	588.630	145.000	588.570	165.000	588.620	185.000	588.530	205.000	588.530	225.000
GR	588.910	245.000	588.680	265.000	588.880	285.000	586.440	305.000	586.730	325.000
GR	588.450	345.000	588.800	365.000	588.850	385.000	588.850	405.000	589.050	410.000
GR	589.080	413.500	589.060	415.000	588.380	417.000	586.660	418.500	586.000	420.000
GR	584.400	423.000	583.590	425.000	583.540	427.000	582.630	429.000	581.870	432.000
GR	582.010	435.000	582.110	438.000	582.270	441.000	582.560	442.500	584.170	444.000
GR	585.340	446.000	586.350	448.000	587.230	448.500	588.450	451.000	588.790	454.000
GR	588.640	457.000	588.600	460.000	588.650	465.000	.000	.000	.000	.000

1

12-05-90 11:10:33 PAGE 4

NH	6.000	.095	98.000	.160	248.000	.120	408.000	.180	437.000	.040
NH	473.000	.100	488.000	.000	.000	.000	.000	.000	.000	.000
X1	10.000	40.000	437.900	473.000	968.000	1010.000	1040.000	.000	.000	.000
GR	588.730	.000	589.190	6.000	589.390	11.000	587.350	38.000	588.970	68.000
GR	586.340	98.000	588.930	128.000	587.960	158.000	588.070	188.000	588.070	218.000
GR	588.700	248.000	589.100	278.000	589.140	308.000	588.910	338.000	588.890	348.000
GR	589.230	368.000	589.370	388.000	589.490	408.000	589.920	428.000	589.990	430.000
GR	590.090	433.000	590.100	437.000	587.710	440.000	585.820	443.000	584.910	446.000
GR	584.600	449.000	583.000	450.000	582.200	452.000	581.450	455.000	581.960	458.000
GR	582.730	461.000	583.000	464.000	583.560	467.300	584.660	468.000	586.430	470.000
GR	588.610	473.000	589.010	474.500	589.350	478.000	589.330	483.000	589.580	488.000
NH	6.000	.090	11.000	.040	50.500	.180	80.000	.160	550.000	.120
NH	680.000	.150	740.000	.000	.000	.000	.000	.000	.000	.000
X1	11.000	47.000	11.000	50.500	665.000	70. ..0	665.000	.000	.000	.000
GR	589.230	.000	589.360	5.000	589.150	11.000	588.070	11.500	587.870	14.000

GR	588.070	16.000	587.170	18.500	586.050	21.000	585.020	22.700	583.230	24.300
GR	582.680	27.000	582.730	30.000	582.730	33.000	583.230	36.000	585.250	37.000
GR	585.390	39.500	586.240	43.000	587.600	45.500	588.290	48.000	588.500	50.000
GR	589.720	50.500	589.740	52.000	589.690	60.000	589.390	80.000	589.330	100.000
GR	589.060	120.000	589.010	130.000	589.260	160.000	588.940	190.000	588.890	220.000
GR	588.830	250.000	588.790	280.000	588.780	310.000	588.890	340.000	588.910	370.000
GR	588.860	400.000	588.840	430.000	588.690	460.000	588.710	490.000	588.600	520.000
GR	588.620	550.000	588.650	580.000	588.490	610.000	588.380	650.000	588.180	680.000
GR	588.360	710.000	588.700	740.000	.000	.000	.000	.000	.000	.000
NH	5.000	.090	20.800	.040	60.500	.180	130.000	.160	190.000	.140
NH	527.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	12.000	43.000	20.800	60.500	616.000	618.000	627.000	.000	.000	.000
GR	589.770	.000	589.810	5.000	589.790	10.000	589.780	15.000	589.750	18.000
GR	589.490	20.800	588.850	21.100	588.510	24.500	587.770	26.000	586.160	28.500
GR	583.460	29.500	583.360	31.000	583.330	34.000	583.030	37.000	582.930	40.000
GR	583.230	43.000	582.900	46.000	583.630	49.000	584.300	50.000	585.110	53.000
GR	589.050	57.000	588.590	59.500	590.130	60.500	590.110	63.000	590.200	70.000
GR	590.030	100.000	589.600	130.000	590.170	146.000	589.020	153.000	588.840	160.000
GR	588.900	190.000	589.270	220.000	589.680	250.000	589.740	280.000	589.930	310.000
GR	589.910	340.000	589.730	370.000	589.570	400.000	589.460	430.000	589.420	460.000
GR	589.520	490.000	588.880	520.000	589.860	527.000	.000	.000	.000	.000
NH	6.000	.120	14.000	.180	164.000	.140	494.000	.160	533.400	.040
NH	570.000	.100	584.000	.000	.000	.000	.000	.000	.000	.000
X1	13.000	44.000	533.400	570.000	572.000	580.000	573.000	.000	.000	.000
GR	589.370	.000	589.570	4.000	588.310	11.000	588.580	14.000	588.870	44.000
GR	588.930	74.000	588.880	104.000	588.980	134.000	588.680	164.000	589.130	194.000
GR	589.180	224.000	589.130	254.000	589.320	284.000	589.790	314.000	589.700	344.000
GR	589.870	374.000	590.080	404.000	590.270	434.000	590.050	464.000	590.190	494.000
GR	590.130	524.000	590.400	527.500	590.500	533.400	589.020	536.500	588.140	536.000
GR	586.770	539.000	585.540	542.000	585.030	544.000	584.360	545.500	584.020	548.000
GR	583.260	551.000	583.220	554.000	583.200	557.000	583.280	560.000	584.020	562.000
GR	584.940	563.000	587.430	566.000	589.060	568.500	589.660	570.000	589.850	572.800
GR	590.150	573.300	590.100	575.000	590.060	579.000	590.030	584.000	.000	.000

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NH	4.000	.075	4.500	.040	43.500	.080	106.000	.075	261.000	.000
X1	14.000	29.000	4.500	43.500	400.000	368.000	384.000	.000	.000	.000
GR	590.100	.000	590.080	3.000	590.240	4.500	589.760	6.000	588.880	8.000
GR	587.640	10.000	584.920	13.000	584.220	14.000	583.700	16.000	583.610	19.000
GR	583.620	22.000	583.520	25.000	583.490	28.000	583.690	31.000	584.220	34.000
GR	584.710	36.000	585.380	37.000	587.420	40.000	588.860	43.000	590.460	43.500
GR	590.550	45.000	590.670	75.000	590.780	106.000	590.960	135.000	590.830	165.000
GR	590.900	195.000	590.840	225.000	589.570	251.000	591.170	261.000	.000	.000
NH	4.000	.160	540.000	.180	693.200	.040	742.000	.100	750.000	.000
X1	15.000	49.000	693.200	742.000	710.000	746.000	729.000	.000	.000	.000
GR	588.390	.000	588.550	20.000	588.450	27.000	588.120	30.000	587.620	34.000
GR	588.060	60.000	588.220	90.000	588.280	120.000	588.420	150.000	588.570	180.000
GR	588.680	210.000	588.860	240.000	589.010	270.000	589.300	300.000	589.530	330.000
GR	589.250	360.000	589.770	390.000	588.890	420.000	589.570	450.000	589.790	480.000
GR	590.030	510.000	590.670	540.000	588.960	570.000	590.430	600.000	590.800	630.000
GR	590.820	660.000	590.790	682.800	590.460	690.000	590.280	693.200	589.170	697.500
GR	587.430	702.000	585.920	706.000	585.250	711.000	584.470	712.000	583.420	714.000
GR	583.770	717.000	583.920	720.000	584.070	723.000	584.170	726.000	584.470	727.500
GR	584.890	728.000	585.770	729.500	586.740	732.000	588.320	735.000	588.640	738.000
GR	589.240	741.300	590.740	742.000	590.890	745.000	590.860	750.000	.000	.000
NH	4.000	.160	92.000	.180	402.000	.040	444.000	.100	452.000	.000
X1	16.000	39.000	402.000	444.000	528.000	540.000	526.000	.000	.000	.000
GR	589.370	.000	589.730	4.000	589.840	16.000	589.110	24.000	589.420	32.000
GR	589.660	62.000	589.800	92.000	589.880	122.000	589.360	152.000	589.870	182.000
GR	590.050	212.000	590.370	242.000	590.400	272.000	590.630	302.000	590.820	332.000
GR	591.190	362.000	591.740	392.000	591.690	400.300	591.560	402.000	589.940	402.500
GR	589.090	405.000	587.920	409.000	586.510	410.000	585.670	411.500	584.760	413.000
GR	584.200	416.000	584.010	419.000	584.290	422.000	584.160	425.000	584.310	428.000
GR	584.560	431.000	584.760	431.700	585.380	434.000	587.610	436.000	588.680	438.000
GR	589.220	440.000	591.310	444.000	591.360	447.000	591.390	452.000	.000	.000
NH	7.000	.070	222.000	.080	312.000	.095	445.500	.040	480.500	.095
NH	1092.000	.075	1452.000	.070	1551.000	.000	.000	.000	.000	.000
X1	17.000	73.000	445.500	480.500	146.000	105.000	120.000	.000	.000	.000
X3	.000	.000	.000	445.500	.000	480.500	596.000	.000	.000	.000
GR	590.840	.000	590.770	12.000	590.930	42.000	591.080	72.000	591.250	102.000
GR	591.410	132.000	591.580	162.000	591.800	192.000	592.080	222.000	592.350	252.000
GR	592.600	282.000	592.830	312.000	593.070	342.000	593.270	372.000	593.490	402.000
GR	593.580	432.000	590.590	445.500	589.770	446.500	589.470	447.000	588.080	449.500
GR	587.180	450.000	586.320	451.000	586.050	453.500	584.580	454.000	584.430	456.000
GR	584.130	459.000	584.130	462.000	584.080	465.000	584.060	468.000	584.580	470.000
GR	585.480	471.000	586.900	474.000	588.380	477.000	589.770	480.000	589.850	480.500
GR	593.660	492.000	593.630	522.000	593.550	552.000	593.330	582.000	593.060	612.000
GR	592.850	642.000	592.650	672.000	592.520	702.000	592.430	732.000	592.310	762.000
GR	592.260	792.000	592.350	822.000	592.200	852.000	592.090	882.000	592.060	912.000
GR	592.030	942.000	592.000	972.000	591.930	1002.000	591.800	1032.000	591.730	1062.000
GR	591.600	1092.000	591.670	1106.000	591.000	1122.000	590.900	1152.000	590.830	1182.000
GR	591.000	1212.000	591.070	1242.000	591.070	1272.000	591.160	1302.000	591.180	1332.000
GR	591.260	1362.000	591.270	1392.000	591.680	1422.000	591.810	1452.000	591.940	1482.000
GR	592.020	1512.000	592.370	1542.000	592.540	1551.000	.000	.000	.000	.000

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NH	7.000	.070	222.000	.080	312.000	.095	445.500	.035	480.500	.095
NH	1092.000	.075	1452.000	.070	1551.000	.000	.000	.000	.000	.000
X1	17.100	77.000	445.500	480.500	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	593.700	.000	593.700	12.000	593.700	42.000	591.080	72.000	591.250	102.000
GR	593.700	132.000	593.700	162.000	593.700	192.000	593.700	222.000	593.700	252.000
GR	593.700	282.000	593.700	312.000	593.700	342.000	593.700	372.000	593.700	402.000
GR	593.700	432.000	593.700	442.300	593.700	445.300	593.700	445.500	589.770	446.500
GR	589.470	447.000	588.080	449.500	587.180	450.000	586.320	451.000	586.050	453.500
GR	584.580	454.000	584.430	456.000	584.130	458.000	584.130	462.000	584.080	465.000
GR	584.060	468.000	584.580	470.000	585.480	000	586.900	474.000	588.380	477.000

GR	589.770	480.000	589.850	480.500	592.150	480.700	593.700	481.700	593.700	492.000
GR	593.700	522.000	593.700	552.000	593.700	582.000	593.700	612.000	593.700	642.000
GR	593.700	672.000	593.700	702.000	593.700	732.000	593.700	762.000	593.700	792.000
GR	593.700	822.000	593.700	852.000	593.700	882.000	593.700	912.000	593.700	942.000
GR	593.700	972.000	593.700	1002.000	593.700	1032.000	593.700	1062.000	593.700	1092.000
GR	593.700	1106.000	593.700	1122.000	593.700	1152.000	593.700	1182.000	593.700	1212.000
GR	593.700	1242.000	593.700	1272.000	593.700	1302.000	593.700	1332.000	593.700	1362.000
GR	593.700	1392.000	593.700	1422.000	593.700	1452.000	593.700	1482.000	593.700	1512.000
GR	593.700	1542.000	593.700	1551.000	.000	.000	.000	.000	.000	.000
X1	17.200	.000	445.500	480.700	4.000	4.000	4.000	.000	.000	.000
X2	.000	.000	.000	592.130	593.700	.000	.000	.000	.000	.000
NH	7.000	.070	222.000	.080	312.000	.095	445.500	.040	480.500	.095
NH	1092.000	.075	1452.000	.070	1551.000	.000	.000	.000	.000	.000
X1	17.300	73.000	445.500	480.500	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	445.500	.000	480.500	596.000	.000	.000	.000
GR	590.840	.000	590.770	12.000	590.930	42.000	591.080	72.000	591.250	102.000
GR	591.410	132.000	591.580	162.000	591.800	192.000	592.080	222.000	592.350	252.000
GR	592.600	282.000	592.830	312.000	593.070	342.000	593.270	372.000	593.490	402.000
GR	593.580	432.000	590.590	445.500	589.770	446.500	589.470	447.000	588.080	449.500
GR	587.180	450.000	586.320	451.000	586.050	453.500	584.580	454.000	584.430	456.000
GR	584.130	459.000	584.130	462.000	584.080	465.000	584.060	468.000	584.580	470.000
GR	585.480	471.000	586.900	474.000	588.380	477.000	589.770	480.000	589.850	480.500
GR	593.660	492.000	593.630	522.000	593.550	552.000	593.330	582.000	593.060	612.000
GR	592.850	642.000	592.650	672.000	592.520	702.000	592.430	732.000	592.310	762.000
GR	592.260	792.000	592.350	822.000	592.200	852.000	592.090	882.000	592.060	912.000
GR	592.030	942.000	592.000	972.000	591.930	1002.000	591.800	1032.000	591.730	1062.000
GR	591.600	1092.000	591.670	1106.000	591.000	1122.000	590.900	1152.000	590.830	1182.000
GR	591.000	1212.000	591.070	1242.000	591.070	1272.000	591.160	1302.000	591.180	1332.000
GR	591.260	1362.000	591.270	1392.000	591.680	1422.000	591.810	1452.000	591.940	1482.000
GR	592.020	1512.000	592.370	1542.000	592.540	1551.000	.000	.000	.000	.000
NH	5.000	.070	55.000	.100	80.500	.044	126.000	.160	150.000	.130
NH	220.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	18.000	43.000	80.500	126.000	153.000	170.000	161.000	.000	.000	.000
GR	591.030	.000	591.380	25.000	591.780	45.000	591.950	55.000	592.030	60.000
GR	591.870	63.000	591.130	64.500	590.910	66.000	590.880	70.000	591.240	73.000
GR	591.040	77.000	591.020	80.500	589.780	82.000	589.200	86.000	587.760	88.000
GR	587.160	89.500	586.570	90.000	585.030	91.000	584.590	92.000	584.240	94.000
GR	584.190	97.000	584.190	100.000	584.190	103.000	583.990	106.000	584.590	107.000
GR	585.320	109.000	586.630	110.500	587.360	111.000	588.100	112.000	588.870	114.000

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GR	589.460	115.500	589.550	118.000	590.150	122.000	590.750	123.000	591.480	125.000
GR	592.090	126.000	591.780	128.000	591.280	130.000	589.880	150.000	590.580	170.000
GR	589.760	190.000	589.960	210.000	590.910	220.000	.000	.000	.000	.000
NH	5.000	.070	240.000	.080	409.000	.046	450.000	.120	710.000	.095
NH	1300.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	19.000	71.000	409.000	450.000	94.000	94.000	94.000	.000	.000	.000
GR	590.750	.000	590.850	30.000	590.920	60.000	590.860	90.000	591.000	120.000
GR	591.080	150.000	591.200	180.000	591.360	210.000	591.460	240.000	591.880	270.000
GR	591.980	275.000	592.100	300.000	592.630	330.000	593.120	360.000	593.710	390.000
GR	592.650	393.600	592.650	393.700	592.500	396.000	591.620	398.000	590.850	400.000
GR	590.290	403.000	591.290	406.000	591.220	409.000	589.890	412.000	588.100	415.000
GR	586.560	417.500	585.100	420.000	584.630	424.000	583.960	427.000	584.100	430.000
GR	584.330	433.000	584.630	436.000	586.330	439.000	587.520	442.000	589.360	445.000
GR	590.830	448.000	591.100	450.000	591.400	453.000	592.400	457.000	592.590	457.900
GR	592.590	458.000	593.680	470.000	593.190	500.000	592.630	530.000	592.150	560.000
GR	591.750	590.000	591.570	620.000	591.420	650.000	591.320	680.000	591.240	710.000
GR	591.270	740.000	591.280	746.000	591.180	770.000	591.080	800.000	590.950	830.000
GR	590.930	860.000	590.990	890.000	590.770	920.000	590.750	950.000	590.800	980.000
GR	590.900	1010.000	591.000	1040.000	591.060	1070.000	591.230	1100.000	591.380	1130.000
GR	591.570	1160.000	591.760	1190.000	591.680	1220.000	591.600	1250.000	591.740	1280.000
GR	591.780	1300.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	5.000	.070	210.000	.080	409.000	.035	450.000	.120	746.000	.095
NH	1300.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	19.100	36.000	409.000	450.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	591.390	.000	591.810	90.000	592.350	210.000	593.340	330.000	592.650	393.700
GR	590.850	400.000	590.290	403.000	591.290	406.000	591.220	409.000	589.890	412.000
GR	588.100	415.000	586.560	417.500	585.100	420.000	584.630	424.000	583.960	427.000
GR	584.100	430.000	584.330	433.000	584.630	436.000	586.330	439.000	587.520	442.000
GR	589.360	445.000	590.830	448.000	591.100	450.000	591.400	453.000	592.400	457.000
GR	592.590	457.900	593.600	458.000	593.650	470.000	593.430	530.000	592.510	650.000
GR	591.780	746.000	591.540	830.000	591.430	950.000	591.910	1070.000	592.070	1130.000
GR	592.500	1300.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	19.200	.000	409.000	450.000	11.000	11.000	11.000	.000	.000	.000
X2	.000	.000	.000	593.600	594.600	.000	.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	5.000	.070	210.000	.080	409.000	.035	450.000	.080	746.000	.070
NH	1300.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	19.300	71.000	409.000	450.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	409.000	.000	450.000	596.000	.000	.000	.000
GR	590.750	.000	590.850	30.000	590.920	60.000	590.860	90.000	591.000	120.000
GR	591.080	150.000	591.200	180.000	591.360	210.000	591.460	240.000	591.880	270.000
GR	591.980	275.000	592.100	300.000	592.630	330.000	593.120	360.000	593.710	390.000
GR	592.650	393.600	592.650	393.700	592.500	396.000	591.620	398.000	590.850	400.000
GR	590.290	403.000	591.290	406.000	591.220	409.000	589.890	412.000	588.100	415.000
GR	586.560	417.500	585.100	420.000	584.630	424.000	583.960	427.000	584.100	430.000
GR	584.330	433.000	584.630	436.000	586.330	439.000	587.520	442.000	589.360	445.000
GR	590.830	448.000	591.100	450.000	591.400	453.000	592.400	457.000	592.590	457.900
GR	592.590	458.000	593.680	470.000	593.190	500.000	592.630	530.000	592.150	560.000
GR	591.750	590.000	591.570	620.000	591.420	650.000	591.320	680.000	591.240	710.000

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GR	591.270	740.000	591.280	746.000	591.180	770.000	591.080	800.000	590.950	830.000
GR	590.930	860.000	590.990	890.000	590.770	920.000	590.750	950.000	590.800	980.000
GR	590.900	1010.000	591.000	1040.000	591.060	1070.000	591.230	1100.000	591.380	1130.000
GR	591.570	1160.000	591.760	1190.000	591.680	1220.000	591.600	1250.000	591.740	1280.000

GR	591.780	1300.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	5.000	.060	240.000	.065	409.000	.035	450.000	.065	710.000	.060
NH	1300.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	20.000	71.000	409.000	450.000	24.000	24.000	24.000	.000	.000	.000
X3	.000	.000	.000	409.000	.000	450.000	596.000	.000	.000	.000
GR	590.750	.000	590.850	30.000	590.920	60.000	590.860	90.000	591.000	120.000
GR	591.080	150.000	591.200	180.000	591.360	210.000	591.460	240.000	591.880	270.000
GR	591.980	275.000	592.100	300.000	592.630	330.000	593.120	360.000	593.710	390.000
GR	593.610	393.600	592.650	393.700	592.500	396.000	591.620	398.000	590.850	400.000
GR	590.290	403.000	591.290	406.000	591.220	409.000	589.890	412.000	588.100	415.000
GR	586.560	417.500	585.100	420.000	584.630	424.000	583.960	427.000	584.100	430.000
GR	584.330	433.000	584.630	436.000	586.330	439.000	587.520	442.000	589.360	445.000
GR	590.830	448.000	591.100	450.000	591.400	453.000	592.400	457.000	592.590	457.900
GR	593.600	458.000	593.680	470.000	593.190	500.000	592.630	530.000	592.150	560.000
GR	591.750	590.000	591.570	620.000	591.420	650.000	591.320	680.000	591.240	710.000
GR	591.270	740.000	591.280	746.000	591.180	770.000	591.080	800.000	590.950	830.000
GR	590.930	860.000	590.990	890.000	590.770	920.000	590.750	950.000	590.800	980.000
GR	590.900	1010.000	591.000	1040.000	591.060	1070.000	591.230	1100.000	591.380	1130.000
GR	591.570	1160.000	591.760	1190.000	591.680	1220.000	591.600	1250.000	591.740	1280.000
GR	591.780	1300.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	5.000	.050	210.000	.055	409.000	.035	450.000	.055	746.000	.050
NH	1300.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	20.100	39.000	409.000	450.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	591.390	.000	591.810	90.000	592.350	210.000	593.340	330.000	592.650	393.700
GR	590.850	400.000	590.290	402.900	593.610	402.900	593.610	403.200	590.290	403.200
GR	591.290	406.000	591.220	409.000	589.890	412.000	588.100	415.000	586.560	417.500
GR	585.100	420.000	584.630	424.000	583.960	427.000	584.100	430.000	584.330	433.000
GR	584.630	436.000	586.330	439.000	587.520	442.000	589.360	445.000	590.830	448.000
GR	591.100	450.000	591.400	453.000	592.400	457.000	592.590	457.900	593.600	458.000
GR	593.650	470.000	593.430	530.000	592.510	650.000	591.780	746.000	591.540	830.000
GR	591.430	950.000	591.910	1070.000	592.070	1130.000	592.500	1300.000	.000	.000
X1	20.200	.000	409.000	450.000	8.000	8.000	8.000	.000	.000	.000
X2	.000	.000	.000	593.600	594.600	.000	.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	5.000	.050	210.000	.055	409.000	.045	450.000	.055	746.000	.050
NH	1300.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	20.300	71.000	409.000	450.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	409.000	.000	450.000	596.000	.000	.000	.000
GR	590.750	.000	590.850	30.000	590.920	60.000	590.860	90.000	591.000	120.000
GR	591.080	150.000	591.200	180.000	591.360	210.000	591.460	240.000	591.880	270.000
GR	591.980	275.000	592.100	300.000	592.630	330.000	593.120	360.000	593.710	390.000
GR	593.610	393.600	592.650	393.700	592.500	396.000	591.620	398.000	590.850	400.000
GR	590.290	403.000	591.290	406.000	591.220	409.000	589.890	412.000	588.100	415.000
GR	586.560	417.500	585.100	420.000	584.630	424.000	583.960	427.000	584.100	430.000
GR	584.330	433.000	584.630	436.000	586.330	439.000	587.520	442.000	589.360	445.000

1

12-05-90 11:10:33 PAGE 9

GR	590.830	448.000	591.100	450.000	591.400	453.000	592.400	457.000	592.590	457.900
GR	593.600	458.000	593.680	470.000	593.190	500.000	592.630	530.000	592.150	560.000
GR	591.750	590.000	591.570	620.000	591.420	650.000	591.320	680.000	591.240	710.000
GR	591.270	740.000	591.280	746.000	591.180	770.000	591.080	800.000	590.950	830.000
GR	590.930	860.000	590.990	890.000	590.770	920.000	590.750	950.000	590.800	980.000
GR	590.900	1010.000	591.000	1040.000	591.060	1070.000	591.230	1100.000	591.380	1130.000
GR	591.570	1160.000	591.760	1190.000	591.680	1220.000	591.600	1250.000	591.740	1280.000
GR	591.780	1300.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	4.000	.045	8.000	.060	65.000	.045	105.800	.070	128.000	.000
X1	21.000	38.000	65.000	105.800	230.000	265.000	253.000	.000	.000	.000
GR	592.840	.000	592.430	5.000	592.410	8.000	592.480	18.000	592.290	28.000
GR	592.430	43.000	591.840	46.000	592.280	48.000	591.690	58.000	591.510	65.000
GR	590.410	65.500	590.160	68.000	590.080	69.000	589.710	72.000	588.360	75.000
GR	586.790	77.500	585.850	78.000	585.500	79.000	585.560	80.500	585.050	83.500
GR	584.750	84.000	584.200	85.000	584.050	88.000	584.450	91.000	584.750	93.000
GR	585.560	95.000	587.010	96.000	587.450	97.500	589.310	99.000	589.560	101.500
GR	589.880	104.000	591.530	105.800	591.460	109.000	591.210	110.000	590.710	116.000
GR	591.560	119.500	591.370	123.000	591.140	128.000	.000	.000	.000	.000
NH	5.000	.070	34.000	.035	74.500	.140	115.000	.120	230.000	.130
NH	571.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	22.000	55.000	34.000	74.500	1178.000	1131.000	1161.000	.000	.000	.000
GR	592.230	.000	591.730	5.000	591.580	10.000	591.480	15.000	591.230	19.000
GR	591.430	22.000	591.030	25.000	590.830	28.000	590.680	31.000	590.730	34.000
GR	590.180	36.500	589.330	38.000	587.080	41.000	586.130	42.000	585.800	44.500
GR	585.520	45.500	585.370	46.000	585.270	49.000	585.300	52.000	585.270	55.000
GR	585.270	58.000	585.250	61.000	585.520	63.500	586.020	64.000	586.510	67.000
GR	587.280	68.000	588.010	69.000	589.130	70.000	590.420	73.000	592.150	74.500
GR	592.110	78.000	592.450	81.000	592.420	84.000	592.430	87.000	591.120	91.000
GR	591.480	115.000	592.020	145.000	592.180	175.000	592.030	205.000	592.400	230.000
GR	592.110	235.000	591.530	265.000	591.910	295.000	592.090	325.000	592.070	355.000
GR	592.100	385.000	592.150	415.000	592.080	445.000	592.100	475.000	591.170	505.000
GR	589.430	525.000	589.720	535.000	590.960	545.000	591.890	565.000	592.190	571.000
NH	8.000	.080	18.500	.044	64.800	.055	120.000	.050	220.000	.045
NH	350.000	.040	655.000	.080	700.000	.060	730.000	.000	.000	.000
X1	23.000	54.000	18.500	64.800	622.000	562.000	617.000	.000	.000	.000
GR	591.800	.000	591.600	5.000	591.900	10.000	592.350	13.000	592.570	16.000
GR	592.620	18.500	591.630	21.000	590.860	24.000	589.580	27.000	588.420	29.000
GR	587.270	31.000	585.930	33.000	585.680	34.000	585.630	37.000	585.580	40.000
GR	585.530	43.000	585.280	45.000	585.830	46.000	585.930	48.000	586.960	50.000
GR	587.460	52.000	588.490	55.000	589.100	58.000	590.490	61.000	591.400	64.000
GR	593.220	64.800	593.210	70.000	592.940	100.000	592.020	120.000	593.090	130.000
GR	592.140	140.000	593.230	160.000	593.210	190.000	593.300	220.000	593.010	250.000
GR	592.940	280.000	592.650	310.000	591.370	330.000	591.800	350.000	593.140	365.000
GR	593.300	390.000	593.320	420.000	593.320	450.000	593.200	480.000	593.110	510.000
GR	592.840	540.000	592.760	570.000	592.100	600.000	592.490	630.000	591.500	655.000
GR	591.450	670.000	593.550	683.000	594.020	700.000	593.500	730.000	.000	.000

1

12-05-90 11:10:33 PAGE 10

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NH    10.000      .090    17.500      .044    73.500      .120   220.000      .130   382.000      .095
NH   435.000      .130   550.000      .140   580.000      .120   660.000      .140   700.000      .120
NH   880.000      .000      .000      .000      .000      .000      .000      .000      .000      .000
X1    24.000    65.000    17.500    73.500   870.000   841.000   870.000      .000      .000      .000
GR   592.760      .000   592.710     5.000   592.910    10.000   592.860    15.000   592.990    17.500
GR   592.470    19.500   591.340    22.500   590.510    24.000   588.070    27.000   586.930    29.000
GR   586.760    31.500   586.660    34.000   586.510    37.000   586.410    40.000   586.310    43.000
GR   586.260    46.000   586.560    46.500   587.240    47.000   588.040    49.000   588.060    52.000
GR   589.060    53.000   589.710    55.000   590.030    57.000   590.830    58.000   591.830    59.500
GR   592.440    61.000   591.930    63.000   591.930    66.000   592.670    69.000   593.870    73.500
GR   593.970   100.000   593.650   130.000   593.620   160.000   593.880   190.000   593.740   220.000
GR   593.500   250.000   593.880   280.000   593.660   310.000   593.580   340.000   593.350   370.000
GR   592.950   382.000   593.900   390.000   592.240   395.000   593.250   400.000   593.360   430.000
GR   593.280   435.000   593.050   460.000   593.180   490.000   593.160   520.000   592.720   550.000
GR   593.390   580.000   593.300   610.000   592.520   635.000   591.290   640.000   589.650   645.000
GR   591.170   650.000   592.460   660.000   593.490   670.000   593.120   700.000   593.120   730.000
GR   593.240   760.000   593.120   790.000   592.870   820.000   592.460   850.000   592.370   880.000

NH    11.000      .060    30.000      .090   128.500      .044   172.500      .160   210.000      .140
NH   360.000      .180   480.000      .140   540.000      .160   630.000      .140   720.000      .120
NH   750.000      .180   886.000      .000      .000      .000      .000      .000      .000      .000
X1    25.000    66.000   128.500   172.500   805.000   870.000   840.000      .000      .000      .000
GR   594.170      .000   594.730    12.000   594.600    20.000   594.600    30.000   593.860    40.000
GR   593.630    50.000   593.510    60.000   593.770    70.000   594.360    80.000   594.550    90.000
GR   594.320   100.000   593.960   105.000   593.960   110.000   594.140   115.000   594.180   120.000
GR   594.150   125.000   594.210   128.500   593.620   131.000   592.160   133.500   590.180   136.000
GR   590.020   136.500   589.960   138.000   589.760   141.000   589.720   144.000   589.690   147.000
GR   589.590   150.000   589.500   153.000   589.470   156.000   589.760   159.000   590.020   161.000
GR   590.360   162.000   591.140   162.500   591.930   165.000   592.750   167.000   593.280   170.000
GR   593.850   172.200   594.960   172.500   595.050   180.000   594.640   210.000   594.090   240.000
GR   594.480   270.000   594.420   300.000   594.270   330.000   594.240   360.000   594.110   390.000
GR   594.050   420.000   593.750   450.000   593.450   480.000   593.100   510.000   593.000   540.000
GR   593.380   570.000   593.610   600.000   593.600   630.000   593.660   660.000   594.000   690.000
GR   593.960   720.000   594.110   750.000   594.440   780.000   592.930   801.000   592.260   845.000
GR   592.740   860.000   593.610   864.000   595.650   869.000   597.170   875.000   597.790   880.000
GR   597.130   886.000      .000      .000      .000      .000      .000      .000      .000      .000

NH     5.000      .180    10.000      .130   191.000      .180   290.000      .044   330.500      .120
NH   346.000      .000      .000      .000      .000      .000      .000      .000      .000      .000
X1    26.000    37.000   290.000   330.500  1068.000  1030.000  1050.000      .000      .000      .000
GR   594.590      .000   593.820     6.000   594.170    10.000   594.290    11.000   594.810    41.000
GR   594.480    71.000   594.730   101.000   594.870   131.000   594.820   161.000   594.830   191.000
GR   594.920   221.000   594.970   251.000   595.010   281.000   594.920   289.000   594.830   290.000
GR   593.440   290.400   593.220   293.300   592.740   294.500   590.860   298.000   590.390   299.700
GR   589.640   300.000   589.240   302.000   588.740   305.000   588.840   308.000   588.890   311.000
GR   589.090   314.000   589.340   317.000   589.440   320.000   589.440   323.000   589.640   324.000
GR   590.560   325.000   592.050   327.000   593.460   330.500   593.590   334.000   593.540   336.000
GR   593.410   341.000   593.320   346.000      .000      .000      .000      .000      .000      .000
1
  12-05-90     11:10:33                                                                    PAGE   11

NH     4.000      .130   159.000      .180   260.000      .044   302.000      .065   309.000      .000
X1    27.000    32.000   260.000   302.000   829.000   805.000   826.000      .000      .000      .000
GR   595.680      .000   594.790     6.000   595.420     9.000   595.110    39.000   595.120    69.000
GR   595.340    99.000   595.410   129.000   595.400   159.000   595.160   189.000   594.860   219.000
GR   594.540   249.000   594.500   260.000   594.190   261.000   593.320   262.500   592.180   264.000
GR   591.050   265.500   590.110   267.000   589.460   270.000   589.510   273.000   589.610   276.000
GR   589.710   279.000   589.610   282.000   589.610   285.000   589.610   288.000   590.110   291.000
GR   591.530   292.000   592.590   294.000   593.460   297.000   594.080   300.000   594.890   302.000
GR   595.000   306.000   594.960   309.000      .000      .000      .000      .000      .000      .000
EJ      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
1
  12-05-90     11:10:33                                                                    PAGE   12
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

 *PROF 1

 CCHV=    .100 CEHV=    .300
 1490 NH CARD USED
 *SECNO 1.000
 2096 WSEL NOT GIVEN,AVG OF MAX,MIN USED
 3280 CROSS SECTION       1.00 EXTENDED       2.16 METERS

      1.00      7.16    584.19       .00       .00    584.35       .17       .00       .00    582.00
      469.        6.      431.        32.       10.      231.       53.        0.        0.    583.01
       .00       .58      1.87       .60      .055       .038     .050      .000    577.03       .00
   .000600        0.        0.        0.         0         0        7       .00     85.00     85.00
0
 1490 NH CARD USED
 *SECNO 2.000
 3280 CROSS SECTION       2.00 EXTENDED       2.48 METERS

      2.00      7.79    584.76       .00       .00    584.91       .15       .55       .00    582.19
      469.       11.      434.        24.       21.      248.       77.      346.      114.    583.95
       .18       .52      1.75       .31      .065       .038     .065      .000    576.97       .00
   .000436     1088.     1094.     1040.         2         0         0       .00    130.00    130.00
0
 1490 NH CARD USED
 *SECNO 3.000
 3280 CROSS SECTION       3.00 EXTENDED       2.40 METERS

      3.00      8.20    586.03       .00       .00    586.15       .13      1.24       .00    584.67
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     469.       2.     405.      62.       5.     239.     307.    1515.     634.    585.38
       .69      .31    1.70      .20     .070     .038     .133     .000  577.83      .00
   .000485   2554.    2734.    2450.       2        0        0      .00  284.00   284.00
0
 1490 NH CARD USED
 *SECNO 4.000
 3280 CROSS SECTION       4.00 EXTENDED       2.20 METERS

      4.00     7.63   587.11      .00      .00   587.19      .08     1.04      .00   584.98
     469.       5.      348.     115.      15.      240.     642.     3322.    1492.    586.23
      1.31      .37     1.45      .18     .065     .040     .158     .000  579.48      .00
   .000351   2530.    2543.    2475.       2        0        0      .00  407.00   407.00
0
1
  12-05-90      11:10:33                                                                PAGE   13

     SECNO     DEPTH     CWSEL     CRIWS     WSELK      EG        HV        HL       OLOSS     BANK ELEV
     Q         QLOB      QCH       QROB      ALOB       ACH       AROB      VOL      TWA     LEFT/RIGHT
     TIME      VLOB      VCH       VROB      XNL        XNCH      XNR       WTN      ELMIN       SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL     IDC       ICONT     CORAR    TOPWID      ENDST

 1490 NH CARD USED
 *SECNO 5.000
 3280 CROSS SECTION       5.00 EXTENDED       1.37 METERS

      5.00     7.57   587.62      .00      .00   587.72      .10      .52      .01   586.80
     469.      121.      337.      11.     578.      208.      25.     4316.    2030.    586.82
      1.57      .21     1.62      .43     .140     .040     .055     .000  580.05      .00
   .000593   1147.    1158.    1186.       1        0        0      .00  516.00   516.00
0
 1490 NH CARD USED
 *SECNO 6.000
 3280 CROSS SECTION       6.00 EXTENDED       1.62 METERS

      6.00     7.43   588.20      .00      .00   588.25      .05      .52      .01   587.53
     469.      121.      347.       1.     626.      316.       7.     5243.    2644.    587.18
      1.91      .19     1.10      .20     .121     .040     .080     .000  580.77      .00
   .000414   1050.    1064.     960.       2        0        0      .00  655.00   655.00
0
 1490 NH CARD USED
 *SECNO 7.000

 3265 DIVIDED FLOW

 3280 CROSS SECTION       7.00 EXTENDED        .76 METERS

      7.00     7.94   588.47      .00      .00   588.61      .14      .34      .03   587.91
     469.       59.      408.       2.     338.      230.       7.     5768.    3037.    587.46
      2.04      .17     1.77      .27     .127     .040     .085     .000  580.53      .00
   .000595    690.     688.      675.       2        0        0      .00  484.12   510.00
0
 1490 NH CARD USED
 *SECNO 8.000

 3265 DIVIDED FLOW

 3280 CROSS SECTION       8.00 EXTENDED       3.27 METERS

      8.00     7.89   588.75      .00      .00   588.75      .00      .13      .01   587.16
     469.       1.      106.      362.       9.      211.    3878.    8379.    4158.    588.80
      3.70      .07      .50      .09     .090     .040     .150     .000  580.86      .00
   .000046   1080.    1120.    1120.       2        0        0      .00 1534.36  1606.00
0
1
  12-05-90      11:10:33                                                                PAGE   14

     SECNO     DEPTH     CWSEL     CRIWS     WSELK      EG        HV        HL       OLOSS     BANK ELEV
     Q         QLOB      QCH       QROB      ALOB       ACH       AROB      VOL      TWA     LEFT/RIGHT
     TIME      VLOB      VCH       VROB      XNL        XNCH      XNR       WTN      ELMIN       SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL     IDC       ICONT     CORAR    TOPWID      ENDST

 1490 NH CARD USED
 *SECNO 9.000

 3265 DIVIDED FLOW

 3280 CROSS SECTION       9.00 EXTENDED        .06 METERS

      9.00     6.76   588.63      .00      .00   588.98      .35      .13      .10   589.06
     469.       39.      430.       0.      87.      157.       0.    10388.    4958.    588.45
      3.80      .45     2.73      .06     .120     .040     .090     .000  581.87      .00
   .001842    915.     920.     926.       2        0        0      .00  195.62   463.02
0
 1490 NH CARD USED
 *SECNO 10.000

 3265 DIVIDED FLOW

 3280 CROSS SECTION      10.00 EXTENDED       1.13 METERS

     10.00     8.41   589.86      .00      .00   589.96      .10      .96      .02   590.10
     469.      138.      329.       1.     552.      195.       9.    10885.    5286.    588.61
      4.03      .25     1.69      .17     .126     .040     .100     .000  581.45      .00
   .000561    968.    1040.    1010.       2        0        0      .00  475.83   488.00
0
 1490 NH CARD USED
 *SECNO 11.000
 3280 CROSS SECTION      11.00 EXTENDED       1.56 METERS

     11.00     7.58   590.26      .00      .00   590.32      .06      .35      .00   589.15
     469.       3.      264.      203.      11.      184.    1010.    11555.    5702.    589.72
      4.24      .23     1.44      .20     .090     .040     .146                582.68      .00
   .000496    665.     665.     700.       2        0        0                740.00   740.00
0
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 1490 NH CARD USED
 *SECNO 12.000
 3280 CROSS SECTION     12.00 EXTENDED       .79 METERS

     12.00     7.66   590.56      .00      .00   590.70      .13      .35      .02   589.49
      469.       4.     380.      85.      17.     213.     461.   12142.     6094.   590.13
      4.36      .24     1.78      .18     .090     .040     .146     .000   582.90      .00
   .000651      616.     627.     618.        2        0        0      .00   527.00   527.00
0
1
  12-05-90     11:10:33                                                                PAGE   15

     SECNO     DEPTH    CWSEL    CRIWS    WSELK     EG       HV       HL       OLOSS    BANK ELEV
     Q         QLOB     QCH      QROB     ALOB      ACH      AROB     VOL      TWA    LEFT/RIGHT
     TIME      VLOB     VCH      VROB     XNL       XNCH     XNR      WTN      ELMIN      SSTA
     SLOPE     XLOBL    XLCH     XLOBR    ITRIAL    IDC      ICONT    CORAR    TOPWID     ENDST

 1490 NH CARD USED
 *SECNO 13.000
 3280 CROSS SECTION     13.00 EXTENDED      1.56 METERS

     13.00     7.73   590.93      .00      .00   591.01      .08      .31      .00   590.50
      469.      152.     315.       3.     792.     202.      13.   12630.     6414.   589.66
      4.50      .19     1.56      .20     .155     .040     .100     .000   583.20      .00
   .000452      572.     573.     580.        2        0        0      .00   584.00   584.00
0
 1490 NH CARD USED
 *SECNO 14.000
 3280 CROSS SECTION     14.00 EXTENDED       .96 METERS

     14.00     7.57   591.06      .00      .00   591.27      .20      .22      .04   590.24
      469.       1.     451.      17.       4.     222.      77.   12887.     6579.   590.46
      4.56      .31     2.03      .22     .075     .040     .076     .000   583.49      .00
   .000749      400.     384.     368.        2        0        0      .00   260.34   260.34
0
 1490 NH CARD USED
 *SECNO 15.000
 3280 CROSS SECTION     15.00 EXTENDED      3.11 METERS

     15.00     8.07   591.49      .00      .00   591.52      .02      .23      .02   590.28
      469.      231.     238.       0.    1534.     251.       5.   13636.     6942.   590.74
      4.92      .18      .95      .10     .161     .040     .100     .000   583.42      .00
   .000176      710.     729.     746.        0        0        0      .00   750.00   750.00
0
 1490 NH CARD USED
 *SECNO 16.000

 3265 DIVIDED FLOW

 3280 CROSS SECTION     16.00 EXTENDED      2.22 METERS

     16.00     7.58   591.59      .00      .00   591.69      .11      .15      .03   591.56
      469.      106.     362.       0.     558.     219.       2.   14314.     7255.   591.31
      5.03      .19     1.65      .09     .172     .040     .100     .000   584.01      .00
   .000557      528.     526.     540.        2        0        0      .00   433.93   452.00
0
1
  12-05-90     11:10:33                                                                PAGE   16

     SECNO     DEPTH    CWSEL    CRIWS    WSELK     EG       HV       HL       OLOSS    BANK ELEV
     Q         QLOB     QCH      QROB     ALOB      ACH      AROB     VOL      TWA    LEFT/RIGHT
     TIME      VLOB     VCH      VROB     XNL       XNCH     XNR      WTN      ELMIN      SSTA
     SLOPE     XLOBL    XLCH     XLOBR    ITRIAL    IDC      ICONT    CORAR    TOPWID     ENDST

 1490 NH CARD USED
 *SECNO 17.000

 3470 ENCROACHMENT STATIONS-     445.5     480.5  TYPE-     1  TARGET-      35.000
     17.00     7.49   591.55      .00      .00   591.85      .30      .10      .06   590.59
      469.       0.     469.       0.       0.     193.       0.   14380.     7288.   596.00
      5.04      .00     2.44      .00     .172     .040     .100     .000   584.06   445.50
   .001236      146.     120.     105.        2        0        0      .00    35.00   480.50
0
 1490 NH CARD USED
 *SECNO 17.100

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA-      593.70 ELREA-      589.85

     17.10     7.49   591.55      .00      .00   591.85      .31      .00      .00   593.70
      469.       0.     469.       0.       0.     192.       0.   14380.     7288.   589.85
      5.04      .00     2.45      .06     .172     .035     .095     .000   584.06   446.05
   .000897       1.       1.       1.        0        0        0      .00    34.60   480.65
0
 *SECNO 17.200

 3265 DIVIDED FLOW

 3370 NORMAL BRIDGE, NRD-   0 MIN ELTRD-  593.70 MAX ELLC-  592.13

     17.20     7.50   591.56      .00      .00   591.86      .30      .00      .00   593.70
      469.       3.     466.       0.      13.     192.       0.   14381.     7288.   589.85
      5.04      .21     2.43      .06     .070     .035     .095     .000   584.06    66.61
   .000885       4.       4.       4.        0        0        0      .00    73.68   480.65
0
 1490 NH CARD USED
 *SECNO 17.300

 3470 ENCROACHMENT STATIONS-     445.5     480.5  TYPE-     1  TARGET-      35.000
     17.30     7.50   591.56      .00      .00   591.86      .30      .00      .00   590.59
      469.       0.     469.       0.       0.     193.       0.               7288.   596.00
      5.04      .00     2.43      .00     .070     .040     .095              584.06   445.50
   .001230       1.       1.       1.        0        0        0               35.00   480.50
0
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECNO 18.000

3265 DIVIDED FLOW

3280 CROSS SECTION 18.00 EXTENDED .98 METERS

18.00	7.90	591.89	.00	.00	592.05	.16	.18	.01	591.02
469.	11.	408.	50.	38.	214.	150.	14429.	7308.	592.09
5.07	.30	1.91	.33	.081	.044	.134	.000	583.99	.00
.001008	153.	161.	170.	2	0	0	.00	207.14	220.00

0
1490 NH CARD USED
*SECNO 19.000

3265 DIVIDED FLOW

3280 CROSS SECTION 19.00 EXTENDED 1.32 METERS

19.00	8.11	592.07	.00	.00	592.12	.05	.06	.01	591.22
469.	78.	275.	117.	272.	218.	596.	14499.	7369.	591.10
5.10	.29	1.26	.20	.071	.046	.097	.000	583.96	.00
.000401	94.	94.	94.	2	0	0	.00	1086.65	1300.00

0
1490 NH CARD USED
*SECNO 19.100

3265 DIVIDED FLOW

3280 CROSS SECTION 19.10 EXTENDED .57 METERS

19.10	8.00	591.96	.00	.00	592.17	.21	.00	.05	591.22
469.	10.	442.	17.	47.	214.	123.	14500.	7369.	591.10
5.10	.21	2.07	.14	.074	.035	.096	.000	583.96	.00
.000644	1.	1.	1.	2	0	0	.00	549.35	1088.99

0
*SECNO 19.200

3265 DIVIDED FLOW

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3280 CROSS SECTION 19.20 EXTENDED .58 METERS

3370 NORMAL BRIDGE,NRD= 0 MIN ELTRD= 594.60 MAX ELLC= 593.60

19.20	8.01	591.97	.00	.00	592.17	.20	.01	.00	591.22
469.	10.	442.	17.	48.	214.	125.	14504.	7375.	591.10
5.10	.21	2.07	.14	.074	.035	.096	.000	583.96	.00
.000641	11.	11.	11.	0	0	0	.00	553.53	1091.12

0
1490 NH CARD USED
*SECNO 19.300
3280 CROSS SECTION 19.30 EXTENDED .16 METERS

3470 ENCROACHMENT STATIONS= 409.0 450.0 TYPE= 1 TARGET= 41.000

19.30	7.98	591.94	.00	.00	592.19	.25	.00	.01	591.22
469.	0.	469.	0.	0.	213.	0.	14504.	7376.	596.00
5.10	.00	2.20	.00	.074	.035	.096	.000	583.96	409.00
.000770	1.	1.	1.	2	0	0	.00	41.00	450.00

0
1490 NH CARD USED
*SECNO 20.000
3280 CROSS SECTION 20.00 EXTENDED .18 METERS

3470 ENCROACHMENT STATIONS= 409.0 450.0 TYPE= 1 TARGET= 41.000

20.00	8.00	591.96	.00	.00	592.21	.25	.02	.00	591.22
469.	0.	469.	0.	0.	213.	0.	14509.	7377.	596.00
5.11	.00	2.20	.00	.074	.035	.096	.000	583.96	409.00
.000762	24.	24.	24.	0	0	0	.00	41.00	450.00

0
1490 NH CARD USED
*SECNO 20.100

3265 DIVIDED FLOW

3280 CROSS SECTION 20.10 EXTENDED .67 METERS

20.10	8.10	592.06	.00	.00	592.22	.16	.00	.01	591.22
469.	16.	410.	43.	61.	218.	161.	14510.	7377.	591.10
5.11	.27	1.88	.27	.051	.035	.050	.000	583.96	.00
.000520	1.	1.	1.	2	0	0	.00	620.58	1125.42

0

```
    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

 *SECNO 20.200

 3265 DIVIDED FLOW

 3280 CROSS SECTION      20.20 EXTENDED        .67 METERS

 3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  594.60 MAX ELLC=  593.60

     20.20      8.10   592.06      .00       .00   592.22      .16       .00       .00   591.22
      469.       17.      409.      44.       62.      218.      163.   14513.    7382.    591.10
      5.11       .27     1.88      .27      .051      .035      .050      .000   583.96       .00
   .000516        8.       8.        8.         0         0         0       .00   623.86   1127.09
0
 1490 NH CARD USED
 *SECNO 20.300
 3280 CROSS SECTION      20.30 EXTENDED        .22 METERS

 3470 ENCROACHMENT STATIONS=      409.0     450.0  TYPE=     1  TARGET=      41.000
     20.30      8.04   592.00      .00       .00   592.25      .24       .00       .03   591.22
      469.        0.      469.      0.        0.      215.        0.   14514.    7382.    596.00
      5.11       .00     2.18      .00      .051      .045      .050      .000   583.96   409.00
   .001225        1.       1.        1.         2         0         0       .00    41.00   450.00
0
 1490 NH CARD USED
 *SECNO 21.000

 3265 DIVIDED FLOW

 3280 CROSS SECTION      21.00 EXTENDED       1.19 METERS

     21.00      8.28   592.33      .00       .00   592.57      .24       .32       .00   591.51
      469.        4.      452.      13.       10.      205.      24.   14571.    7399.    591.53
      5.14       .39     2.21      .55      .060      .045      .070      .000   584.05    25.91
   .001342      230.      253.      265.         2         0         0       .00    90.84   128.00
0
 1490 NH CARD USED
 *SECNO 22.000
1
  12-05-90     11:10:33                                                                  PAGE   20

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

 3280 CROSS SECTION      22.00 EXTENDED        .87 METERS

     22.00      7.81   593.06      .00       .00   593.14      .08       .55       .02   590.73
      469.        19.      352.      98.       58.      250.      632.   15246.    7776.    592.15
      5.43       .32     1.41      .16      .070      .035      .129      .000   585.25       .00
   .000242     1178.    1161.     1131.         3         0         0       .00   571.00   571.00
0
 1490 NH CARD USED
 *SECNO 23.000

 3265 DIVIDED FLOW

 3280 CROSS SECTION      23.00 EXTENDED       1.47 METERS

     23.00      7.98   593.26      .00       .00   593.34      .07       .20       .00   592.62
      469.        7.      331.      131.      23.      239.      298.   15683.    8106.    593.22
      5.58       .31     1.39      .44      .080      .044      .047      .000   585.28       .00
   .000466      622.      617.      562.         2         0         0       .00   588.97   681.25
0
 1490 NH CARD USED
 *SECNO 24.000

 3265 DIVIDED FLOW

 3280 CROSS SECTION      24.00 EXTENDED       1.37 METERS

     24.00      7.48   593.74      .00       .00   593.84      .10       .49       .01   592.99
      469.        4.      378.      87.       16.      242.      411.   16208.    8672.    593.87
      5.77       .27     1.56      .21      .090      .044      .120      .000   586.26       .00
   .000719      870.      870.      841.         2         0         0       .00   752.94   880.00
0
 1490 NH CARD USED
 *SECNO 25.000

 3265 DIVIDED FLOW

 3280 CROSS SECTION      25.00 EXTENDED        .39 METERS

     25.00      5.08   594.55      .00       .00   594.69      .14       .84       .01   594.21
      469.        17.      318.      134.      52.      161.      525.   16812.    9343.    594.96
      5.93       .32     1.98      .26      .089      .044      .161      .000   589.47       .00
   .001453      805.      840.      870.         2         0         0       .00   801.89   866.32
0
1
  12-05-90     11:10:33                                                                  PAGE   21

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST
```

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1490 NH CARD USED
*SECNO 26.000
3280 CROSS SECTION      26.00 EXTENDED       2.34 METERS

     26.00      6.92   595.66       .00       .00   595.82       .16      1.13       .01   594.83
       469.       50.      406.       13.      260.      215.       34.     17464.     9942.    593.46
      6.11       .19     1.89       .37      .142      .044      .120      .000    588.74       .00
   .000828     1068.     1050.     1030.         2         0         0       .00    346.00    346.00
0
1490 NH CARD USED
*SECNO 27.000
3280 CROSS SECTION      27.00 EXTENDED       1.37 METERS

     27.00      6.87   596.33       .00       .00   596.47       .14       .65       .00   594.50
       469.       63.      401.        4.      308.      222.       10.     17898.    10213.    594.89
      6.25       .21     1.80       .47      .151      .044      .065      .000    589.46       .00
   .000743      829.      826.      805.         2         0         0       .00    309.00    309.00
0
1
  12-05-90     11:10:33                                                                    PAGE   22


                                                                                THIS RUN EXECUTED 12-05-90

**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
**************************************************

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

PILE RIVER FLOODPLAIN ST

SUMMARY PRINTOUT TABLE  110

      SECNO     CWSEL    DIFKWS      EG      TOPWID     QLOB      QCH      QROB     PERENC    STENCL    STCHL     STCHR     STENCR
      1.000    584.19       .00    584.35      85.00     5.62    431.39     31.99       .00       .00     4.50     47.70       .00
      2.000    584.76       .00    584.91     130.00    10.98    434.36     23.66       .00       .00     8.50     48.50       .00
      3.000    586.03       .00    586.15     284.00     1.60    404.92     62.48       .00       .00     4.00     47.50       .00
      4.000    587.11       .00    587.19     407.00     5.44    348.13    115.43       .00       .00     9.70     50.30       .00
      5.000    587.62       .00    587.72     516.00    121.26    336.91     10.83       .00       .00   446.90    491.00       .00
      6.000    588.20       .00    588.25     655.00    120.62    346.96      1.42       .00       .00   550.00    645.80       .00
      7.000    588.47       .00    588.61     484.12     59.08    407.95      1.97       .00       .00   459.00    502.00       .00
      8.000    588.75       .00    588.75    1534.36       .62    106.26    362.13       .00       .00    10.00     46.50       .00
      9.000    588.63       .00    588.98     195.62     38.96    430.02       .01       .00       .00   415.00    451.00       .00
     10.000    589.86       .00    589.96     475.83    138.23    329.32      1.45       .00       .00   437.00    473.00       .00
     11.000    590.26       .00    590.32     740.00      2.53    263.95    202.52       .00       .00    11.00     50.50       .00
     12.000    590.56       .00    590.70     527.00      3.99    379.85     85.16       .00       .00    20.80     60.50       .00
     13.000    590.93       .00    591.01     584.00    151.75    314.73      2.52       .00       .00   533.40    570.00       .00
     14.000    591.06       .00    591.27     260.34      1.33    450.81     16.86       .00       .00     4.50     43.50       .00
     15.000    591.49       .00    591.52     750.00    230.74    237.77       .49       .00       .00   693.20    742.00       .00
     16.000    591.59       .00    591.69     433.93    106.46    362.38       .16       .00       .00   402.00    444.00       .00
     17.000    591.55       .00    591.85      35.00       .00    469.00       .00     35.00    445.50    445.50    480.50    480.50
1
  12-05-90     11:10:33                                                                    PAGE   23

      SECNO     CWSEL    DIFKWS      EG      TOPWID     QLOB      QCH      QROB     PERENC    STENCL    STCHL     STCHR     STENCR
     17.100    591.55       .00    591.85      34.60       .00    468.99       .01       .00       .00   445.50    480.50       .00
     17.200    591.56       .00    591.86      73.68      2.88    466.11       .01       .00       .00   445.50    480.50       .00
     17.300    591.56       .00    591.86      35.00       .00    469.00       .00     35.00    445.50    445.50    480.50    480.50
     18.000    591.89       .00    592.05     207.14     11.25    407.93     49.82       .00       .00    80.50    126.00       .00
     19.000    592.07       .00    592.12    1086.65     77.72    274.68    116.59       .00       .00   409.00    450.00       .00
     19.100    591.96       .00    592.17     549.35      9.91    442.16     16.93       .00       .00   409.00    450.00       .00
     19.200    591.97       .00    592.17     553.53     10.09    441.61     17.31       .00       .00   409.00    450.00       .00
     19.300    591.94       .00    592.19      41.00       .00    469.00       .00     41.00    409.00    409.00    450.00    450.00
     20.000    591.96       .00    592.21      41.00       .00    469.00       .00     41.00    409.00    409.00    450.00    450.00
     20.100    592.06       .00    592.22     620.58     16.38    409.55     43.08       .00       .00   409.00    450.00       .00
     20.200    592.06       .00    592.22     623.86     16.57    408.79     43.65       .00       .00   409.00    450.00       .00
     20.300    592.00       .00    592.25      41.00       .00                .00     41.00    409.00    409.00    450.00    450.00
     21.000    592.33       .00    592.57      90.84      3.84               13.45       .00       .00    65.00    105.80       .00
```

22.000	593.06	.00	593.14	571.00	10.84	352.12	98.05	.00	.00	34.00	74.50	.00
23.000	593.26	.00	593.34	588.97	7.02	330.81	131.17	.00	.00	18.50	64.80	.00
24.000	593.74	.00	593.84	752.94	4.32	377.94	86.74	.00	.00	17.50	73.50	.00
25.000	594.55	.00	594.69	801.89	16.60	318.13	134.27	.00	.00	128.50	172.50	.00
26.000	595.66	.00	595.82	346.00	49.88	406.34	12.77	.00	.00	290.00	330.50	.00
27.000	596.33	.00	596.47	309.00	63.38	401.12	4.49	.00	.00	260.00	302.00	.00

PILE RIVER FLOODPLAIN ST

SUMMARY PRINTOUT TABLE 120

SECNO	CWSEL	EG	VCH	10K*S	DEPTH	TOPWID	CLSTA	BW	STCHL	XLBEL	STCHR	RBEL
1.000	584.19	584.35	1.87	6.00	7.16	85.00	.00	.01	4.50	582.00	47.70	583.01
2.000	584.76	584.91	1.75	4.36	7.79	130.00	.00	.01	8.50	582.19	48.50	583.95
3.000	586.03	586.15	1.70	4.85	8.20	284.00	.00	.01	4.00	584.67	47.50	585.38
4.000	587.11	587.19	1.45	3.51	7.63	407.00	.00	.01	9.70	584.98	50.30	586.23
5.000	587.62	587.72	1.62	5.93	7.57	516.00	.00	.01	446.90	586.80	491.00	586.82
6.000	588.20	588.25	1.10	4.14	7.43	655.00	.00	.01	550.00	587.53	645.80	587.18
7.000	588.47	588.61	1.77	5.95	7.94	484.12	.00	.01	459.00	587.91	502.00	587.46
8.000	588.75	588.75	.50	.46	7.89	1534.36	.00	.01	10.00	587.16	46.50	588.80
9.000	588.63	588.98	2.73	18.42	6.76	195.62	.00	.01	415.00	589.06	451.00	588.45
10.000	589.86	589.96	1.69	5.61	8.41	475.83	.00	.01	437.00	590.10	473.00	588.61
11.000	590.26	590.32	1.44	4.96	7.58	740.00	.00	.01	11.00	589.15	50.50	589.72
12.000	590.56	590.70	1.78	6.51	7.66	527.00	.00	.01	20.80	589.49	60.50	590.13
13.000	590.93	591.01	1.56	4.52	7.73	584.00	.00	.01	533.40	590.50	570.00	589.66
14.000	591.06	591.27	2.03	7.49	7.57	260.34	.00	.01	4.50	590.24	43.50	590.46
15.000	591.49	591.52	.95	1.76	8.07	750.00	.00	.01	693.20	590.28	742.00	590.74
16.000	591.59	591.69	1.65	5.57	7.58	433.93	.00	.01	402.00	591.56	444.00	591.31
17.000	591.55	591.85	2.44	12.36	7.49	35.00	.00	.01	445.50	590.59	480.50	596.00
17.100	591.55	591.85	2.45	8.97	7.49	34.60	.00	.01	445.50	593.70	480.50	589.85
17.200	591.56	591.86	2.43	8.85	7.50	73.68	.00	.01	445.50	593.70	480.50	589.85
17.300	591.56	591.86	2.43	12.30	7.50	35.00	.00	.01	445.50	590.59	480.50	596.00
18.000	591.89	592.05	1.91	10.08	7.90	207.14	.00	.01	80.50	591.02	126.00	592.09
19.000	592.07	592.12	1.26	4.01	8.11	1086.65	.00	.01	409.00	591.22	450.00	591.10
19.100	591.96	592.17	2.07	6.44	8.00	549.35	.00	.01	409.00	591.22	450.00	591.10
19.200	591.97	592.17	2.07	6.41	8.01	553.53	.00	.01	409.00	591.22	450.00	591.10

SECNO	CWSEL	EG	VCH	10K*S	DEPTH	TOPWID	CLSTA	BW	STCHL	XLBEL	STCHR	RBEL
19.300	591.94	592.19	2.20	7.70	7.98	41.00	.00	.01	409.00	591.22	450.00	596.00
20.000	591.96	592.21	2.20	7.62	8.00	41.00	.00	.01	409.00	591.22	450.00	596.00
20.100	592.06	592.22	1.88	5.20	8.10	620.58	.00	.01	409.00	591.22	450.00	591.10
20.200	592.06	592.22	1.88	5.16	8.10	623.86	.00	.01	409.00	591.22	450.00	591.10
20.300	592.00	592.25	2.18	12.25	8.04	41.00	.00	.01	409.00	591.22	450.00	596.00
21.000	592.33	592.57	2.21	13.42	8.28	90.84	.00	.01	65.00	591.51	105.80	591.53
22.000	593.06	593.14	1.41	2.42	7.81	571.00	.00	.01	34.00	590.73	74.50	592.15
23.000	593.26	593.34	1.39	4.66	7.98	588.97	.00	.01	18.50	592.62	64.80	593.22
24.000	593.74	593.84	1.56	7.19	7.48	752.94	.00	.01	17.50	592.99	73.50	593.87
25.000	594.55	594.69	1.98	14.53	5.08	801.89	.00	.01	128.50	594.21	172.50	594.96
26.000	595.66	595.82	1.89	8.28	6.92	346.00	.00	.01	290.00	594.83	330.50	593.46
27.000	596.33	596.47	1.80	7.43	6.87	309.00	.00	.01	260.00	594.50	302.00	594.89

PILE RIVER FLOODPLAIN ST

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
1.000	.00	.00	.00	577.03	469.00	584.19	.00	584.35	6.00	1.87	293.40	191.42
2.000	1094.00	.00	.00	576.97	469.00	584.76	.00	584.91	4.36	1.75	346.02	224.67
3.000	2734.00	.00	.00	577.83	469.00	586.03	.00	586.15	4.85	1.70	550.35	212.99
4.000	2543.00	.00	.00	579.48	469.00	587.11	.00	587.19	3.51	1.45	896.27	250.23
5.000	1158.00	.00	.00	580.05	469.00	587.62	.00	587.72	5.93	1.62	810.94	192.62
6.000	1064.00	.00	.00	580.77	469.00	588.20	.00	588.25	4.14	1.10	949.30	230.38
7.000	688.00	.00	.00	580.53	469.00	588.47	.00	588.61	5.95	1.77	575.21	192.33
8.000	1120.00	.00	.00	580.86	469.00	588.75	.00	588.75	.46	.50	4099.30	692.53
9.000	920.00	.00	.00	581.87	469.00	588.63	.00	588.98	18.42	2.73	244.48	109.28
10.000	1040.00	.00	.00	581.45	469.00	589.86	.00	589.96	5.61	1.69	755.58	198.09
11.000	665.00	.00	.00	582.68	469.00	590.26	.00	590.32	4.96	1.44	1204.45	210.63
12.000	627.00	.00	.00	582.90	469.00	590.56	.00	590.70	6.51	1.78	690.68	183.82
13.000	573.00	.00	.00	583.20	469.00	590.93	.00	591.01	4.52	1.56	1007.77	220.63
14.000	384.00	.00	.00	583.49	469.00	591.06	.00	591.27	7.49	2.03	303.04	171.33
15.000	729.00	.00	.00	583.42	469.00	591.49	.00	591.52	1.76	.95	1790.06	353.04
16.000	526.00	.00	.00	584.01	469.00	591.59	.00	591.69	5.57	1.65	779.48	198.68
17.000	120.00	.00	.00	584.06	469.00	591.55	.00	591.85	12.36	2.44	192.50	133.40
17.100	1.00	.00	.00	584.06	469.00	591.55	.00	591.85	8.97	2.45	191.69	156.55
17.200	4.00	593.70	592.13	584.06	469.00	591.56	.00	591.86	8.85	2.43	205.17	157.62
17.300	1.00	.00	.00	584.06	469.00	591.56	.00	591.86	12.30	2.43	192.84	133.75
18.000	161.00	.00	.00	583.99	469.00	591.89	.00	592.05	10.08	1.91	401.22	147.75
19.000	94.00	.00	.00	583.96	469.00	592.07	.00	592.12	4.01	1.26	1085.99	234.30
19.100	1.00	.00	.00	583.96	469.00	591.96	.00	592.17	6.44	2.07	383.10	184.74
19.200	11.00	594.60	593.60	583.96	469.00	591.97	.00	592.17	6.41	2.07	386.23	185.31

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
19.300	1.00	.00	.00	583.96	469.00	591.94	.00	592.19	7.70	2.20	212.71	169.06
20.000	24.00	.00	.00	583.96	469.00	591.96	.00	592.21	7.62	2.20	213.40	169.90
20.100	1.00	.00	.00	583.96	469.00	592.06	.00	592.22	5.20	1.88	439.55	205.70
20.200	8.00	594.60	593.60	583.96	469.00	592.06	.00	592.22	5.16	1.88	442.32	206.37
20.300	1.00	.00	.00	583.96	469.00	592.00	.00	592.25	12.25	2.18	215.35	133.97
21.000	253.00	.00	.00	584.05	469.00	592.33	.00	592.57	13.42	2.21	238.85	128.04
22.000	1161.00	.00	.00	585.25	469.00	593.06	.00	593.14	2.42	1.41	940.15	301.49
23.000	617.00	.00	.00	585.28	469.00	593.26	.00	593.34	4.66	1.39	559.12	217.28
24.000	870.00	.00	.00	586.26	469.00	593.74	.00	593.84	7.19	1.56	669.79	174.89
25.000	840.00	.00	.00	589.47	469.00	594.55	.00	594.69	14.53	1.98	737.90	123.03
26.000	1050.00	.00	.00	588.74	469.00	595.66	.00	595.82	8.28	1.89	509.81	163.00
27.000	826.00	.00	.00	589.46	469.00	596.33	.00	596.47	7.43	1.80	539.60	172.08

PILE RIVER FLOODPLAIN ST

SUMMARY PRINTOUT TABLE 130

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1.000	469.00	584.19	.00	.00	.00	85.00	.00
2.000	469.00	584.76	.00	.58	.00	130.00	1094.00
3.000	469.00	586.03	.00	1.26	.00	284.00	2734.00
4.000	469.00	587.11	.00	1.09	.00	407.00	2543.00
5.000	469.00	587.62	.00	.51	.00	.0	1158.00

6.000	469.00	588.20	.00	.58	.00	655.00	1064.00
7.000	469.00	588.47	.00	.27	.00	484.12	688.00
8.000	469.00	588.75	.00	.28	.00	1534.36	1120.00
9.000	469.00	588.63	.00	-.12	.00	195.62	920.00
10.000	469.00	589.86	.00	1.23	.00	475.83	1040.00
11.000	469.00	590.26	.00	.40	.00	740.00	665.00
12.000	469.00	590.56	.00	.30	.00	527.00	627.00
13.000	469.00	590.93	.00	.36	.00	584.00	573.00
14.000	469.00	591.06	.00	.14	.00	260.34	384.00
15.000	469.00	591.49	.00	.43	.00	750.00	729.00
16.000	469.00	591.59	.00	.09	.00	433.93	526.00
17.000	469.00	591.55	.00	-.04	.00	35.00	120.00
17.100	469.00	591.55	.00	.00	.00	34.60	1.00
17.200	469.00	591.56	.00	.01	.00	73.68	4.00
17.300	469.00	591.56	.00	.00	.00	35.00	1.00
18.000	469.00	591.89	.00	.33	.00	207.14	161.00
19.000	469.00	592.07	.00	.18	.00	1086.65	94.00
19.100	469.00	591.96	.00	-.11	.00	569.35	1.00
19.200	469.00	591.97	.00	.01	.00	553.53	11.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
19.300	469.00	591.94	.00	-.03	.00	41.00	1.00
20.000	469.00	591.96	.00	.02	.00	41.00	24.00
20.100	469.00	592.06	.00	.10	.00	620.58	1.00
20.200	469.00	592.06	.00	.01	.00	623.86	8.00
20.300	469.00	592.00	.00	-.06	.00	41.00	1.00
21.000	469.00	592.33	.00	.33	.00	90.84	253.00
22.000	469.00	593.06	.00	.73	.00	571.00	1161.00
23.000	469.00	593.26	.00	.20	.00	586.97	617.00
24.000	469.00	593.74	.00	.47	.00	752.94	870.00
25.000	469.00	594.55	.00	.81	.00	801.89	840.00
26.000	469.00	595.66	.00	1.11	.00	346.00	1050.00
27.000	469.00	596.33	.00	.66	.00	309.00	826.00

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 12-05-90

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
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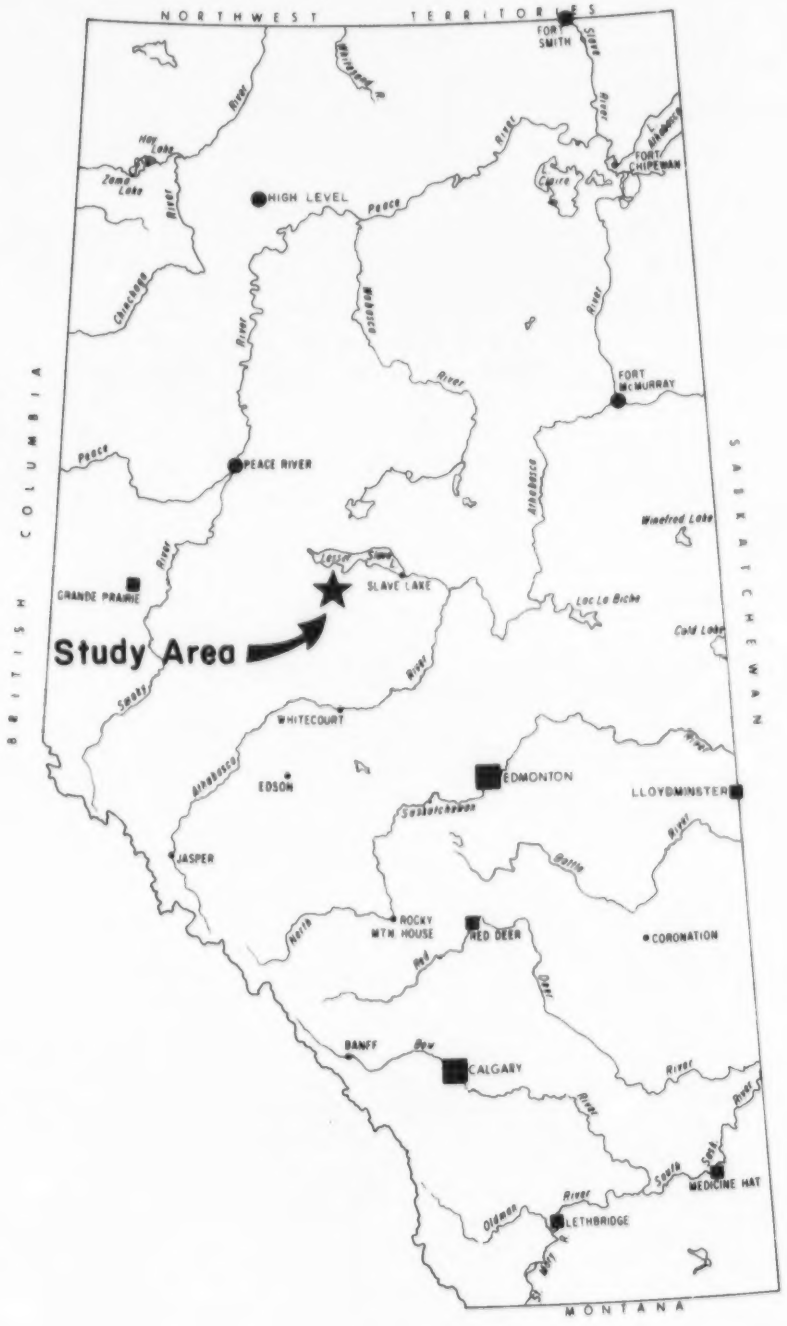
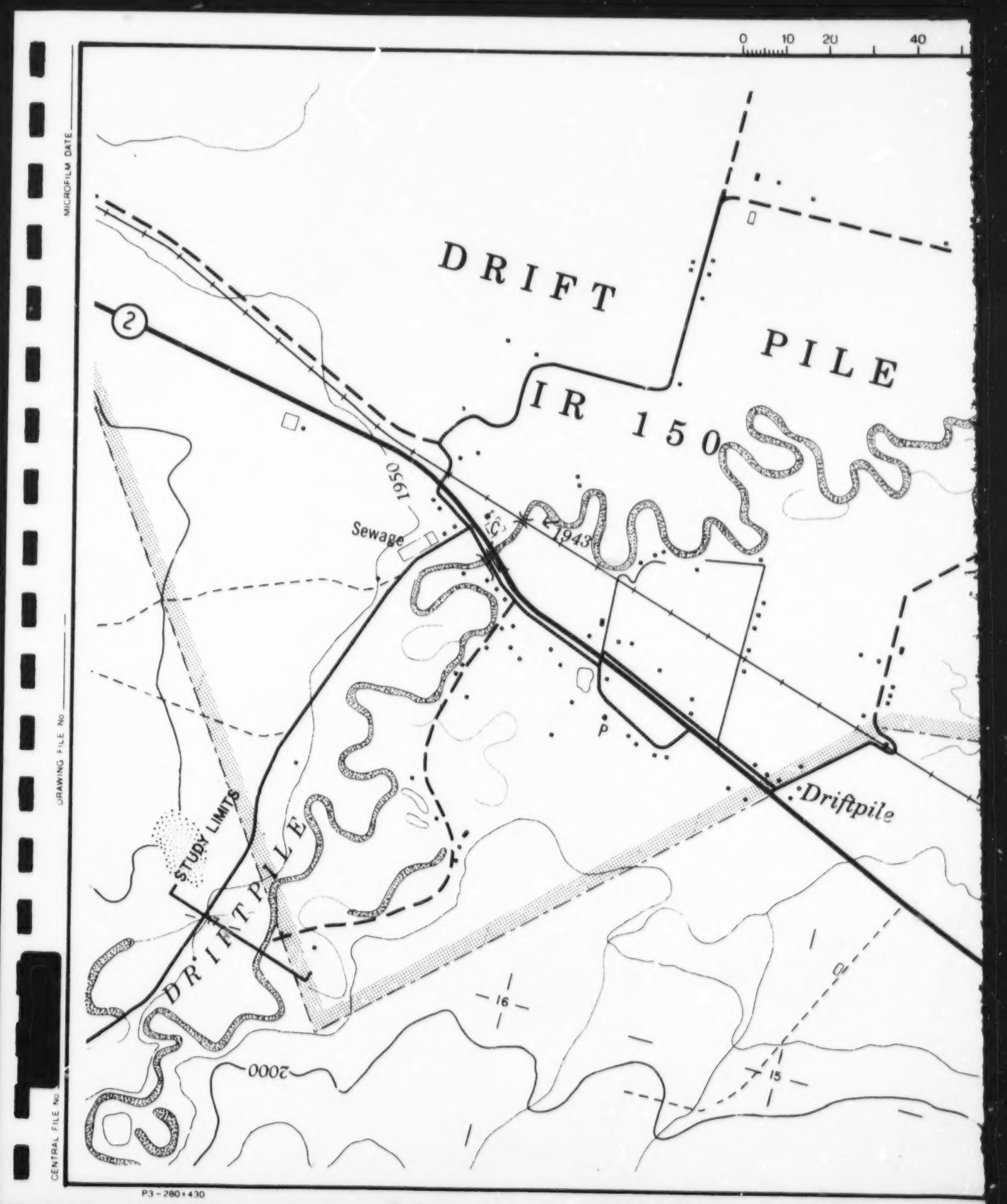


Alberta ENVIRONMENT	RIVER ENGINEERING BRANCH	DRIFTPILE FLOODPLAIN STUDY
DESIGNED	SCALE N/A	LOCATION PLAN
DRAWN S. Y. C.	DATE NOV. 1990	
CHECKED	SHEET 1 OF 1	FIGURE No. 1

FILE No

P4-215 x 280


0 10 20 40
DRIFT
PILE
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1950
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Sewage
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Driftpile
STUDY LIMITS
DRIFTPILE
16
15
2000
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MICROFILM DATE
DRAWING FILE No
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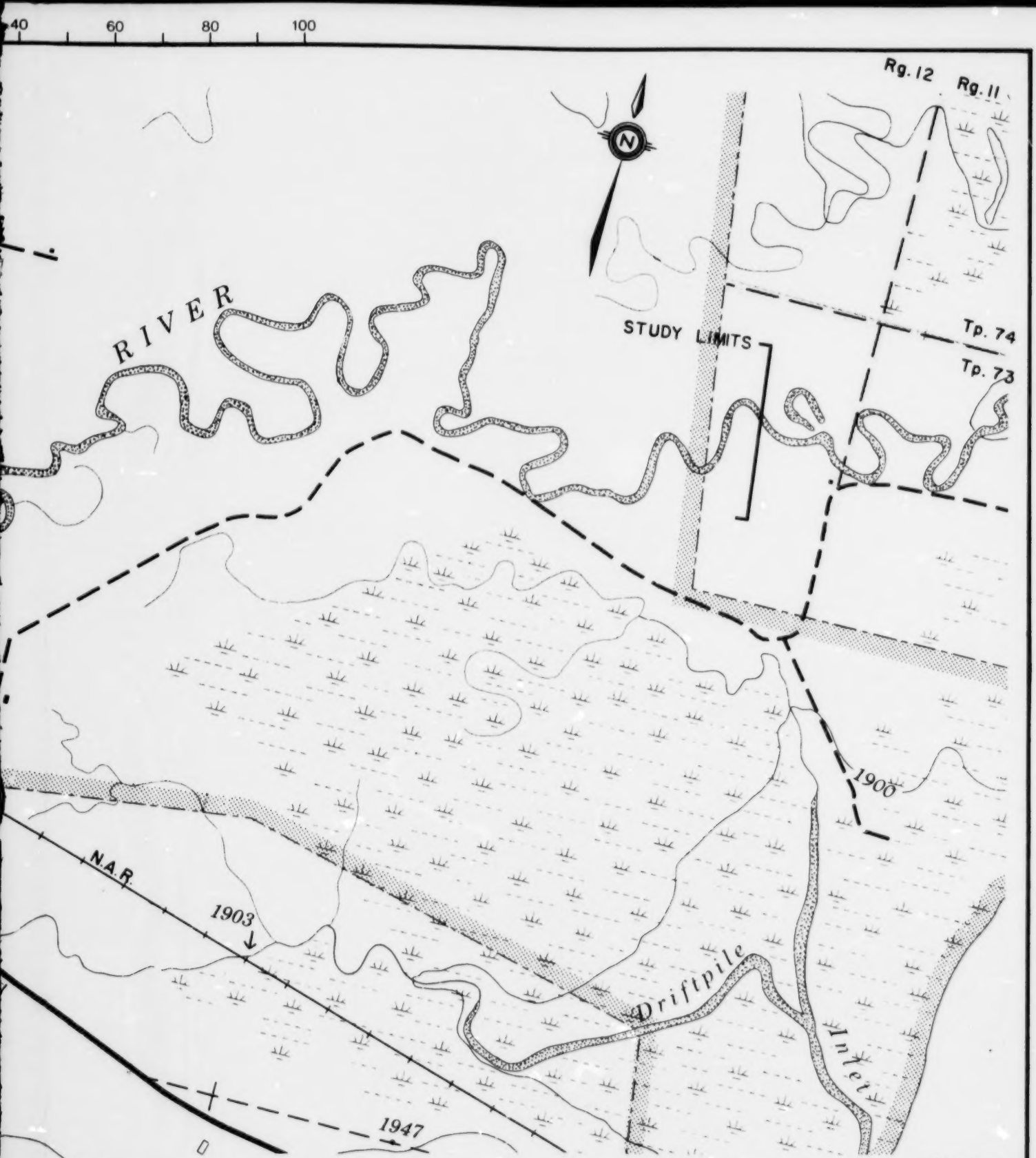
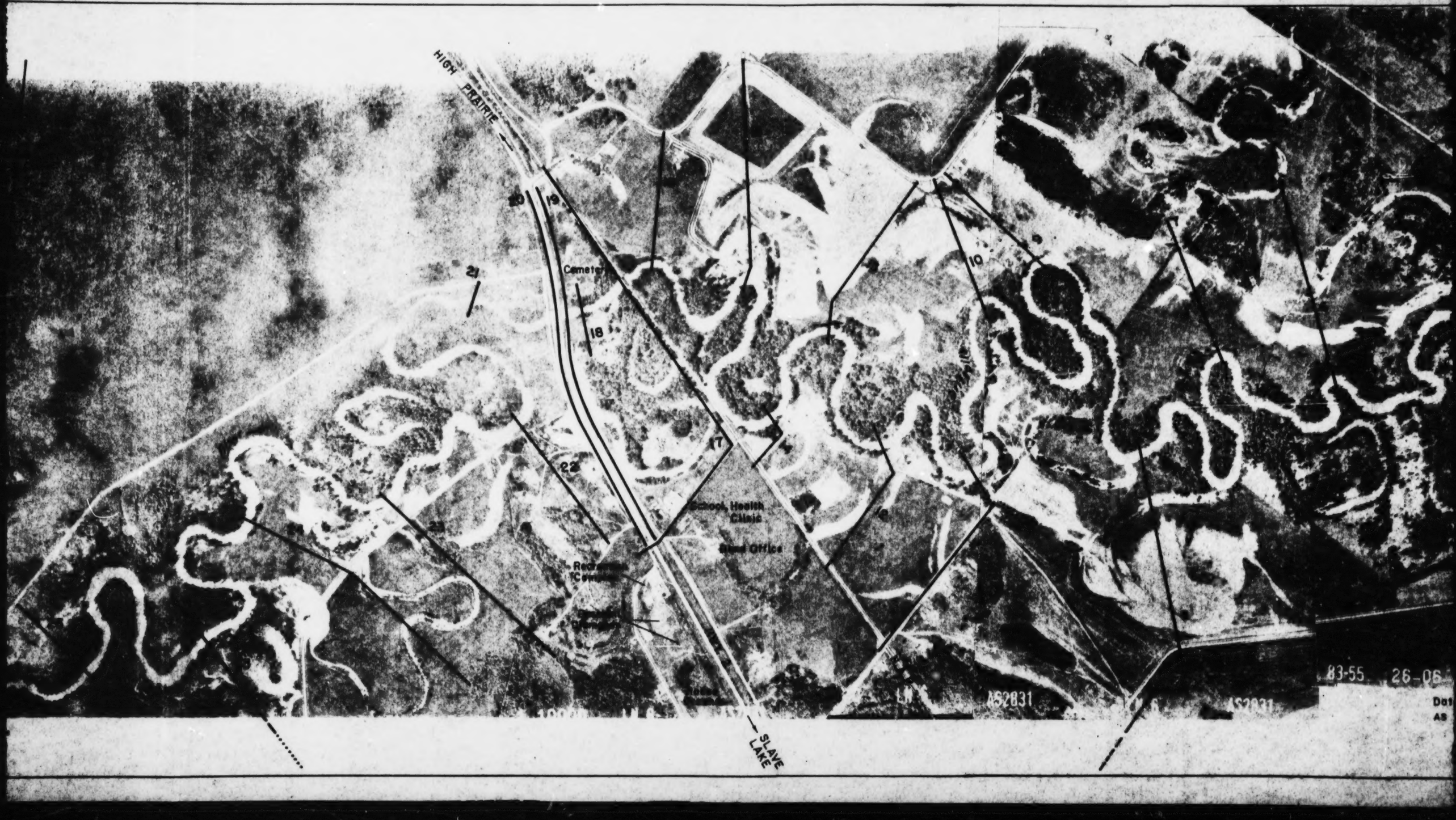
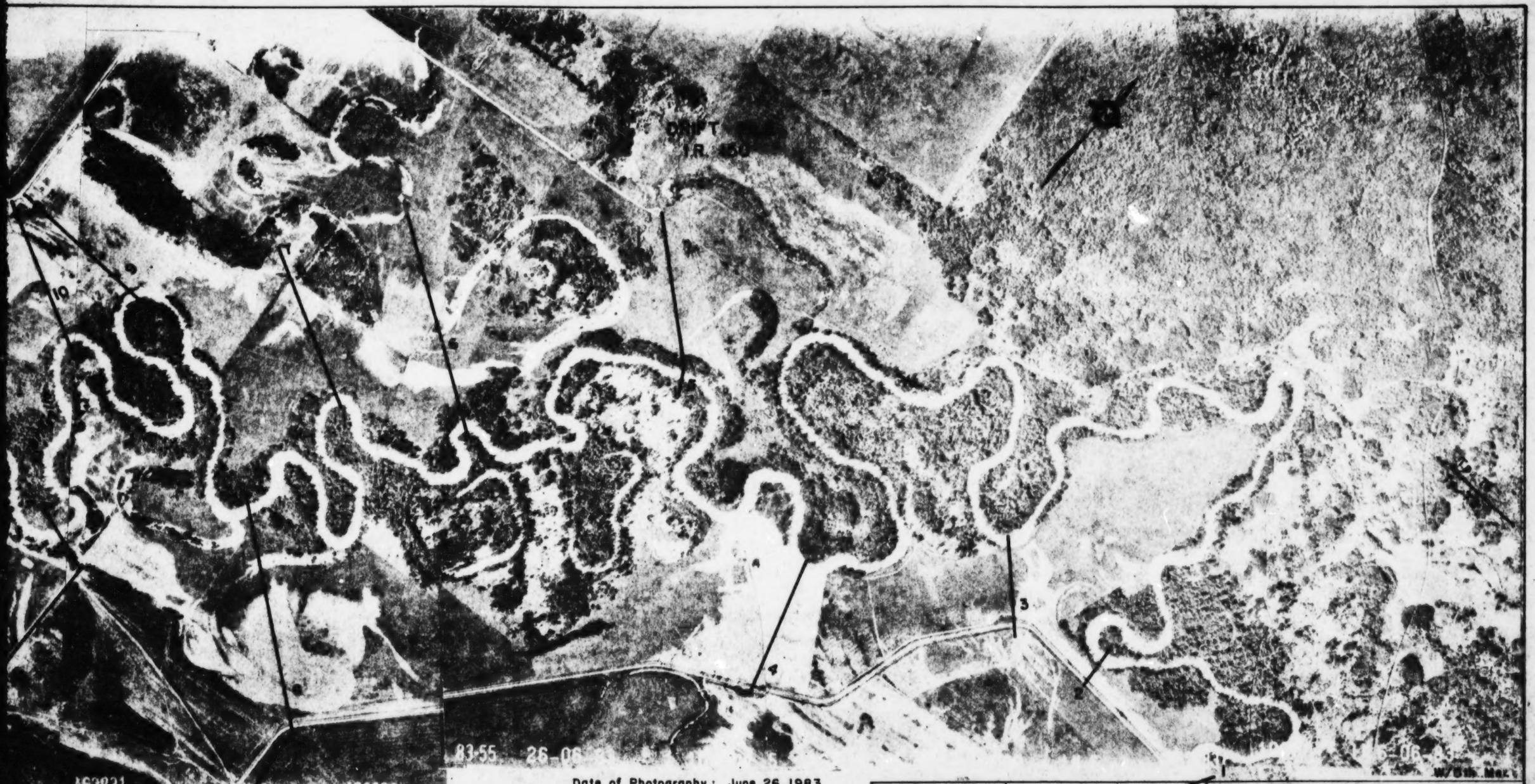
P3 - 280 x 430



Alberta ENVIRONMENT	RIVER ENGINEERING BRANCH	DRIFTPILE RIVER
DESIGNED S. Lowe	SCALE 1:25 000	STUDY LIMITS
DRAWN L.M.	DATE November 1990	
CHECKED	SHEET 1 OF 1	FIGURE No. 2


HIGH PRAIRIE
Cemetery
School, Health Clinic
Band Office
SLAVE LAKE
83-55 26-06



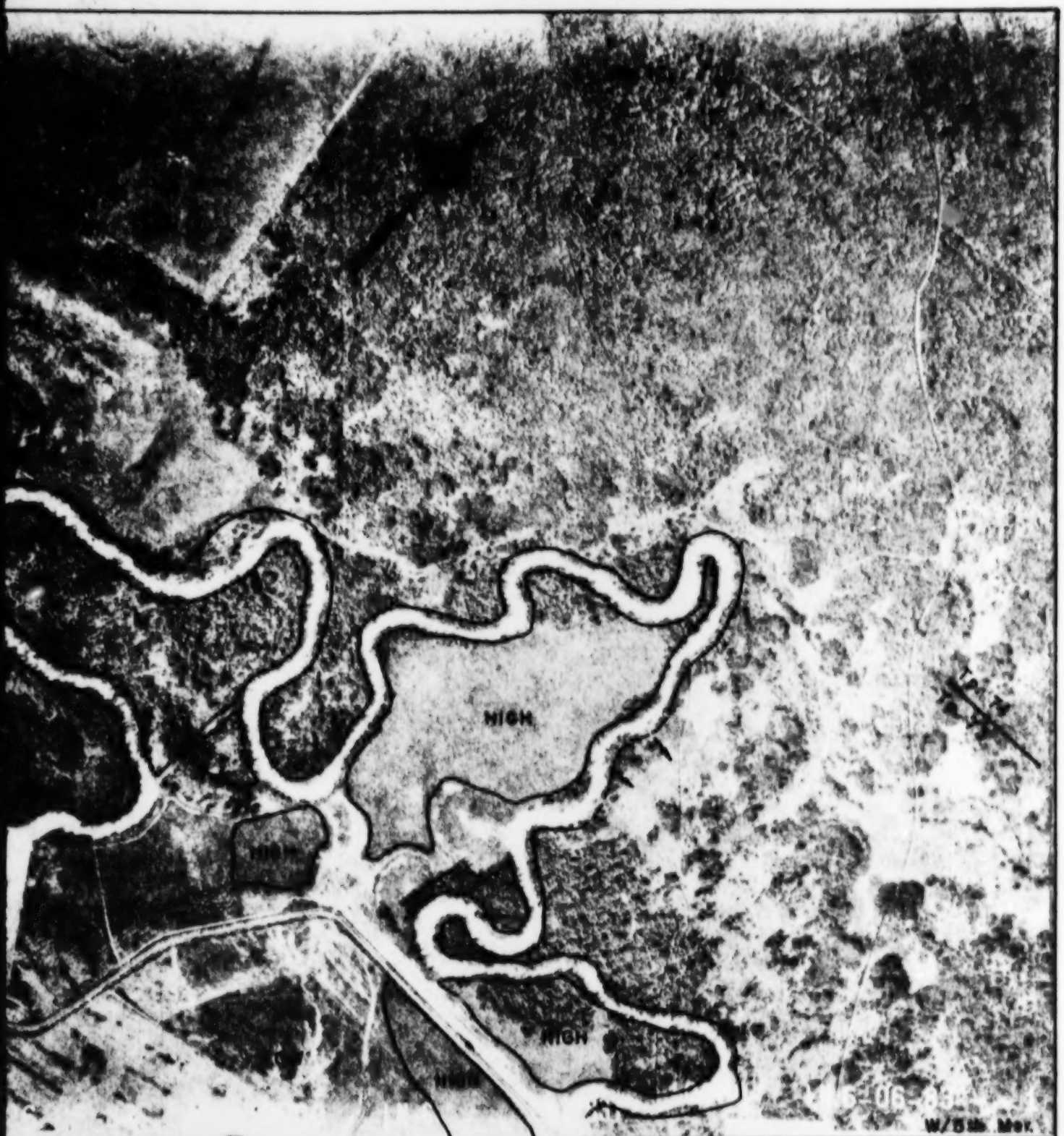
Date of Photography : June 26, 1983
AS 2831

Alberta ENVIRONMENT	RIVER ENGINEERING BRANCH	DRIFTPILE RIVER
DESIGNED S. deal	SCALE 1: 10000	1983 FLOOD MOSAIC CROSS SECTION LOCATIONS
DRAWN	DATE NOV., 1990	
CHECKED	SHEET OF	FIGURE No. 3

LOW

Date of Photography : June 26, 1983
AS 2831

Alberta ENVIRONMENT	RIVER ENGINEERING BRANCH	DRIFTPILE
DESIGNED S. Jones	SCALE 1: 10000	1983 F
DRAWN	DATE NOV., 1990	DRIFTPI
CHECKED	SHEET OF	



Alberta ENVIRONMENT	RIVER ENGINEERING BRANCH	DRIFTPILE RIVER
DESIGNED S. Lowe	SCALE 1:10000	1983 FLOOD MOSAIC
DRAWN L.A.	DATE NOV., 1990	DRIFTPILE I.R. # 150
CHECKED	SHEET OF	FIGURE No. 4

MAPS
NOT
FILMED

CARTES
OMISES